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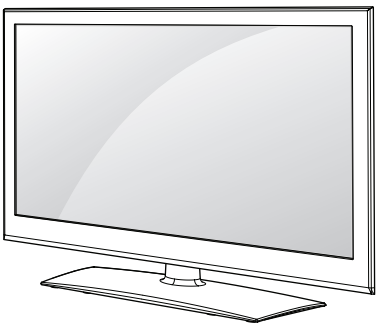
LED LCD TV
SERVICE MANUAL

CHASSIS : LD11U

MODEL : 42LV355T 42LV355T-ZC

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL67084805 (1104-REV00)

Printed in Korea

CONTENTS

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10 mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

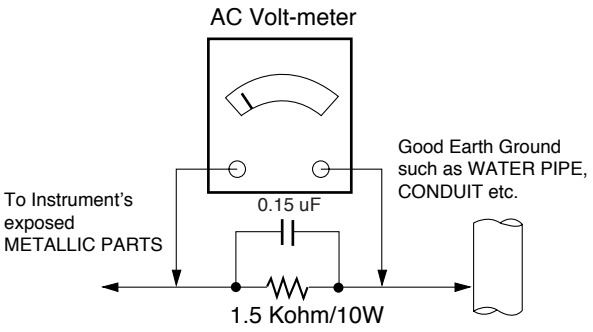
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 MΩ and 5.2 MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5 mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω
*Base on Adjustment standard

SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the *SAFETY PRECAUTIONS* on page 3 of this publication.
NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 % - 99 % strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. *Use with this receiver only the test fixtures specified in this service manual.*
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices.* Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500 °F to 600 °F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25 cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500 °F to 600 °F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500 °F to 600 °F)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor

Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied to the LCD TV used LD11U chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

1) Temperature: 25 ºC ± 5 ºC(77 ºF ± 9 ºF), CST: 40 ºC ± 5 ºC
2) Relative Humidity : 65 % ± 10 %
3) Power Voltage
   : Standard input voltage (AC 100-240 V~, 50/60 Hz)
   * Standard Voltage of each products is marked by models.
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 5 minutes prior to the adjustment.

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety: CE, IEC specification
   - EMC:CE, IEC

4. Model General Specification

No.	Item	Specification	Remarks
1	Market	England/Ireland	
2	Broadcasting system	1) PAL-I/I' 2) DVB-T/C 3) DVB-T2	
3	Receiving system	Analog : Upper Heterodyne Digital : COFDM, QAM	► DVB-T - Guard Interval(Bitrate_Mbit/s) 1/4, 1/8, 1/16, 1/32 - Modulation : Code Rate QPSK : 1/2, 2/3, 3/4, 5/6, 7/8 16-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 64-QAM : 1/2, 2/3, 3/4, 5/6, 7/8 ► DVB-C - Symbolrate : 4.0Msymbols/s to 7.2Msymbols/s - Modulation : 16QAM, 64-QAM, 128-QAM and 256-QAM ► DVB-T2 - Guard Interval(Bitrate_Mbit/s) 1/4,1/8,1/16,1/32,1/128,19/128,19/256, - Modulation : Code Rate QPSK : 1/2, 2/5, 2/3, 3/4, 5/6 16-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 64-QAM : 1/2, 2/5, 2/3, 3/4, 5/6 256-QAM : 1/2, 2/5, 2/3, 3/4, 5/6
4	Scart Jack (1EA)	PAL, SECAM	Scart Jack is Full scart and support RF-OUT(analog & DTV) Not support DTV Auto AV
5	Video Input RCA(1EA)	PAL, SECAM, NTSC	4System : PAL, SECAM, NTSC, PAL60
6	Component Input(1EA)	Y/Cb/Cr, Y/Pb/Pr	
7	RGB Input	RGB-PC	Analog(D-SUB 15PIN)
8	HDMI Input (3EA)	HDMI1-DTV (DVI), HDMI2-DTV, HDMI3-DTV	PC(HDMI version 1.3), Support HDCP
9	Audio Input (3EA)	RGB/DVI Audio, Component, AV	L/R Input
10	SDPIF out (1EA)	SPDIF out	
11	LAN Jack(1EA)	LAN(Wired)	HD MHEG
12	Earphone out (1EA)	Antenna, AV1, AV2, Component, RGB, HDMI1, HDMI2, HDMI3, USB	
13	USB (1EA)	EMF	JPEG, MP3
		For Service (download), DivX HD	

5. Component Video Input (Y, CB/PB, CR/PR)

No.	Specification				Remark
	Resolution	H-freq(kHz)	V-freq(Hz)		
1.	720x480	15.73	60.00	SDTV,DVD 480i	
2.	720x480	15.63	59.94	SDTV,DVD 480i	
3.	720x480	31.47	59.94	480p	
4.	720x480	31.50	60.00	480p	
5.	720x576	15.625	50.00	SDTV,DVD 625 Line	
6.	720x576	31.25	50.00	HDTV 576p	
7.	1280x720	45.00	50.00	HDTV 720p	
8.	1280x720	44.96	59.94	HDTV 720p	
9.	1280x720	45.00	60.00	HDTV 720p	
10.	1920x1080	31.25	50.00	HDTV 1080i	
11.	1920x1080	33.75	60.00	HDTV 1080i	
12.	1920x1080	33.72	59.94	HDTV 1080i	
13.	1920x1080	56.250	50	HDTV 1080p	
14.	1920x1080	67.5	60	HDTV 1080p	

6. RGB (PC)

No.	Specification				Proposed	Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel Clock(MHz)		
1.	720*400	31.468	70.08	28.321		For only DOS mode
2.	640*480	31.469	59.94	25.17	VESA	Input 848*480 60 Hz, 852*480 60 Hz -> 640*480 60 Hz Display
3.	800*600	37.879	60.31	40.00	VESA	
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	
5.	1360*768	47.72	59.8	84.75	WXGA	
6.	1920*1080	66.587	59.93	138.625	WUXGA	FHD model

7. HDMI Input

(1) DTV Mode

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*480	31.469/ 31.5	59.94/60	27.00/ 27.03	SDTV 480P	
2.	720*576	31.25	50	54	SDTV 576P	
3.	1280*720	37.500	50	74.25	HDTV 720P	
4.	1280*720	44.96/ 45	59.94/ 60	74.17/ 74.25	HDTV 720P	
5.	1920*1080	33.72/ 33.75	59.94/ 60	74.17/ 74.25	HDTV 1080I	
6.	1920*1080	28.125	50.00	74.25	HDTV 1080I	
7.	1920*1080	26.97/27	23.97/24	74.17/ 74.25	HDTV 1080P	
8.	1920*1080	33.716/ 33.75	29.976/ 30.00	74.25	HDTV 1080P	
9.	1920*1080	56.250	50	148.5	HDTV 1080P	
10.	1920*1080	67.43/ 67.5	59.94/ 60	148.35/ 148.50	HDTV 1080P	

(2) PC Mode

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*400	31.468	70.08	28.321		HDCP
2.	640*480	31.469	59.94	25.17	VESA	HDCP
3.	800*600	37.879	60.31	40.00	VESA	HDCP
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	HDCP
5.	1360*768	47.72	59.8	84.75	WXGA	HDCP
6.	1280*1024	63.981	60.02	108.875	SXGA	HDCP/FHD model
7.	1920*1080	67.5	60	148.5	WUXGA	HDCP/FHD model

ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to all of the LCD TV with LD11U chassis.

2. Designation

1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
2) Power Adjustment: Free Voltage
3) Magnetic Field Condition: Nil.
4) Input signal Unit: Product Specification Standard
5) Reserve after operation: Above 5 Minutes (Heat Run)
   Temperature : at 25 ºC ± 5 ºC
   Relative humidity : 65 % ± 10 %
   Input voltage : 220 V, 60 Hz
6) Adjustment equipments: Color Analyzer(CA-210 or CA-110), DDC Adjustment Jig equipment, Service remote control.
7) Push the “IN STOP” key - For memory initialization.

Case1 : Software version up
1. After downloading S/W by USB, TV set will reboot automatically.
2. Push “In-stop” key.
3. Push “Power on” key.
4. Function inspection
5. After function inspection, Push “In-stop” key.

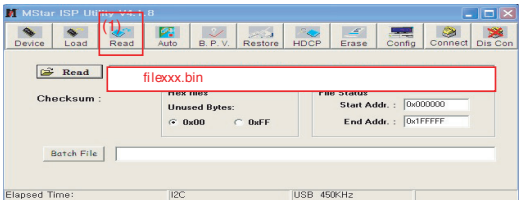
Case2 : Function check at the assembly line
1. When TV set is entering on the assembly line, Push “In-stop” key at first.
2. Push “Power on” key for turning it on.
   -> If you push “Power on” key, TV set will recover channel information by itself.
3. After function inspection, Push “In-stop” key.

3. Main PCB check process

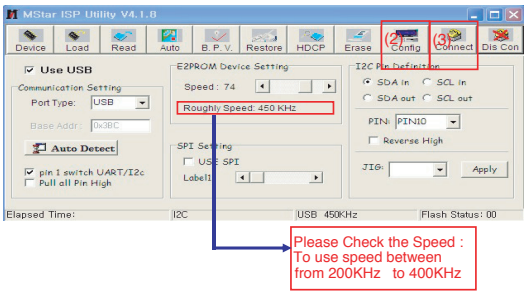
* APC - After Manual-Insult, executing APC

* Boot file Download

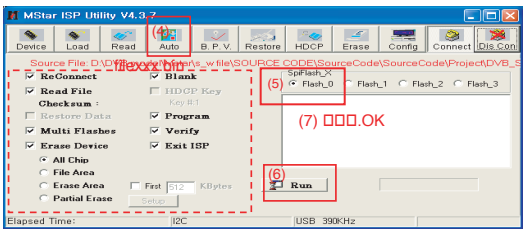
1) Execute ISP program “Mstar ISP Utility” and then click “Config” tab.
2) Set as below, and then click “Auto Detect” and check “OK” message
   If “Error” is displayed, check connection between computer, jig, and set.
3) Click “Read” tab, and then load download file(XXXX.bin) by clicking “Read”



4) Click “Connect” tab. If “Can’t” is displayed, check connection between computer, jig, and set.

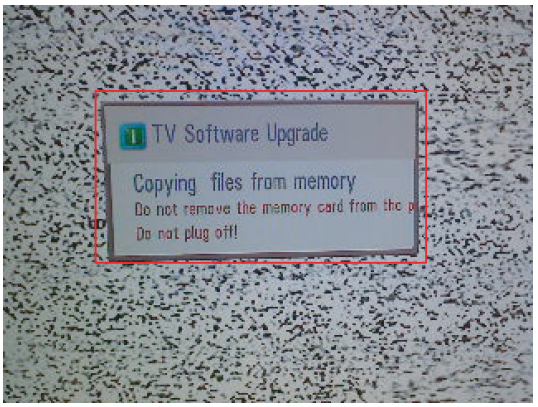


5) Click “Auto” tab and set as below.
6) Click “Run”.
7) After downloading, check “OK” message.

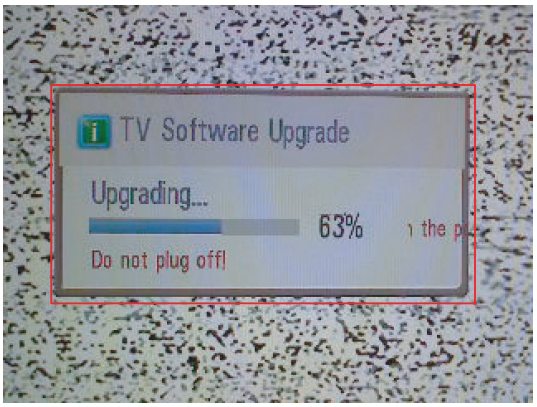


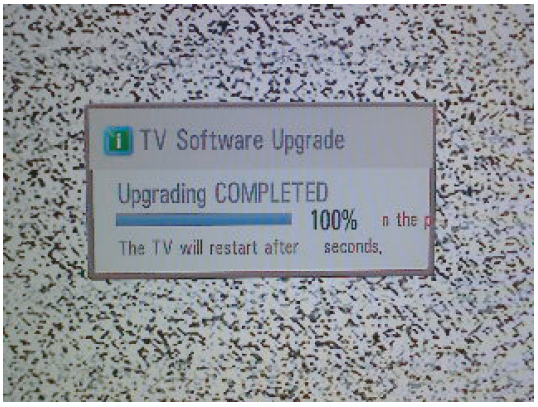
* USB DOWNLOAD

1) Put the USB Stick to the USB socket.
2) Automatically detecting update file in USB Stick.
   - If your downloaded program version in USB Stick is Low, it didn’t work. But your downloaded version is High, USB data is automatically detecting.
3) Show the message “Copying files from memory”.



4) Updating is starting.





5) Uploading completed, the TV will restart automatically.
6) If your TV is turned on, check your updated version and Tool option.(explain the Tool option, next stage)
   * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.

*** After downloading, have to adjust Tool option again.**

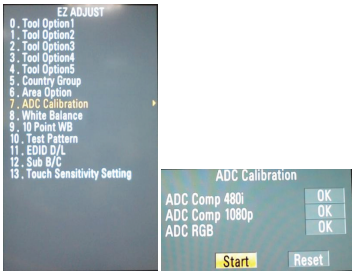
1) Push "IN-START" key in service remote control.
2) Select "Tool option 1" and push "OK" key.
3) Punch in the number. (Each model has their number)

Module	Tool option1	Tool option2	Tool option3	Tool option4	Tool option5
CMI	26468	18986	55341	28952	352
AUO	26472	18986	55339	28952	288

4) Completed selecting Tool option.

3.1. ADC Process

(1) ADC
- Enter Service Mode by pushing "ADJ" key,
- Enter Internal ADC mode by pushing "▶" key at "7. ADC Calibration".



<Caution> Using 'P-ONLY' key on Adjustment remote control, power on TV.

* ADC Calibration Protocol (RS232)

Item	CMD1	CMD2	Data0		
Adjust 'Mode In'	A	A	0	0	When transfer the 'Mode In', Carry the command.
ADC Adjust	A	D	1	0	Automatically adjustment (The use of a internal pattern)

Adjust Sequence
- aa 00 00 [Enter Adjust Mode]
- xb 00 40 [Component1 Input (480i)]
- ad 00 10 [Adjust 480i Comp1]
- xb 00 60 [RGB Input (1024*768)]
- ad 00 10 [Adjust 1024*768 RGB]
- aa 00 90 End Adjust mode

* Required equipment : Adjustment remote control.

3.2. Function Check

* Check display and sound.
- Check Input and Signal items. (cf. work instructions)
  1) TV
  2) AV1/2
  3) COMPONENT (480i)
  4) RGB (PC : 1024 x 768 @ 60 Hz)
  5) HDMI
  6) PC Audio In

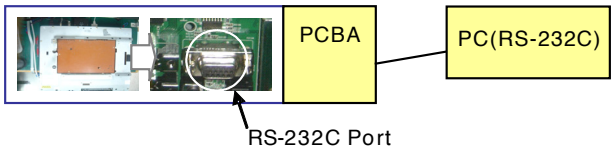
  * Display and Sound check is executed by Remote control.

4. MAC Address & CI+ key download

4.1. MAC Address

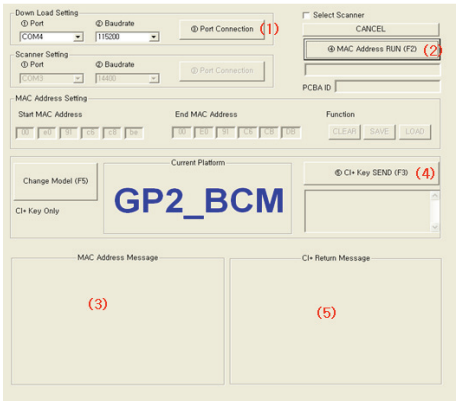
(1) Equipment & Condition
- Play file: Serial.exe
- MAC Address edit
- Input Start / End MAC address

(2) Download method
1) Communication Port connection

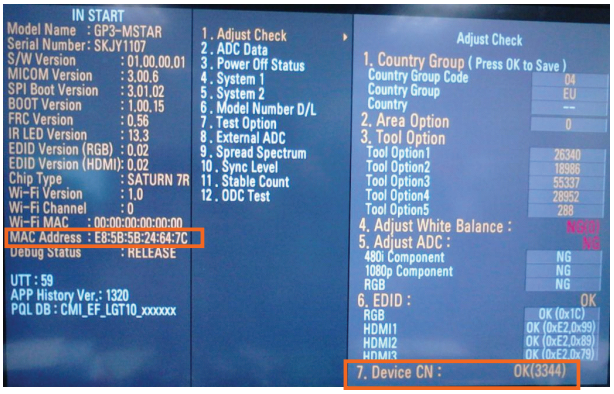


Connect: PCBA Jig-> RS-232C Port== PC-> RS-232C Port

2) MAC Address & CI+ key Download
- Set CI+ key path Directory at start Mac & CI Download Program
- Com 1,2,3,4 and 115200(Baud rate)

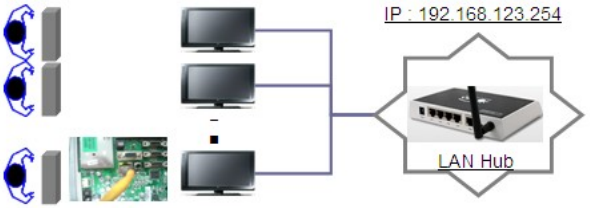


- Click Port “connection” button(1).
- Push the (2) MAC Address write.
- At success Download, check the OK.(3)
- Start CI+ Download, push the (4).
- Check the OK or NG.

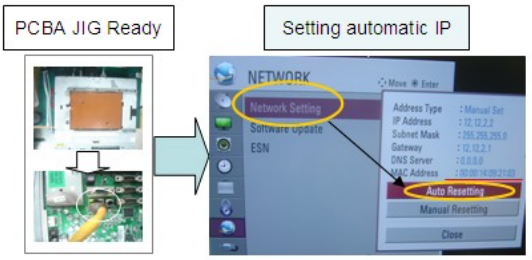


4.2. LAN

(1) Equipment & Condition
- Each other connection to LAN Port of IP Hub and Jig



(2) LAN inspection solution
- LAN Port connection with PCB
- Network setting at MENU Mode of TV
- setting automatic IP
- Setting state confirmation
  -> If automatic setting is finished, you confirm IP and MAC Address.

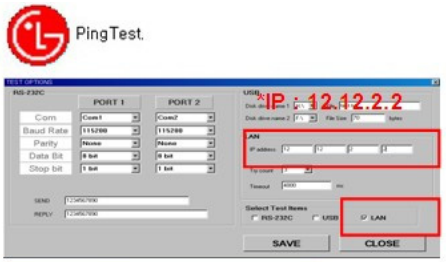


4.3. LAN PORT INSPECTION(PING TEST)

Connect SET -> LAN port == PC -> LAN Port

(1) Equipment setting
1) Play the LAN Port Test PROGRAM.
2) Input IP set up for an inspection to Test Program.
   *IP Number : 12.12.2.2

(2) LAN PORT inspection (PING TEST)
1) Play the LAN Port Test Program.
2) Connect each other LAN Port Jack.
3) Play Test (F9) button and confirm OK Message.
4) Remove LAN CABLE.



5. Total Assembly line process

5.1. Adjustment Preparation

· W/B Equipment condition
CA210
: CCFL/EEFL -> CH9, Test signal: Inner pattern(80IRE)
LED -> CH14, Test signal: Inner pattern(80IRE)

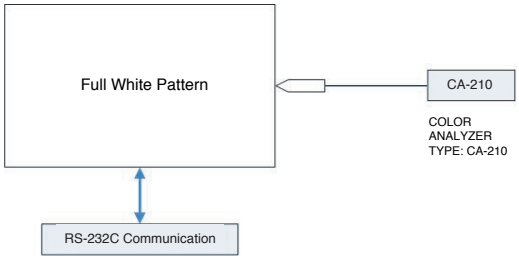
· Above 5 minutes H/run in the inner pattern. (“power on” key on Adjustment remote control)

Cool	13,000	K	X=0.269(±0.002)	
			Y=0.273(±0.002)	<Test Signal>
Medium	9,300	K	X=0.285(±0.002)	Inner pattern
			Y=0.293(±0.002)	(204 gray, 80 IRE)
Warm	6,500	K	X=0.313(±0.002)	
			Y=0.329(±0.002)	

· Edge LED W/B Table is process of time (Only LGD Module)
CA210: CH14, Test signal : Inner pattern(80IRE)

GP2R	Aging Time (Min.)	Cool		Medium		Warm	
		X	Y	X	Y	X	Y
		269	273	285	293	313	329
1	0-2	279	288	295	308	319	338
2	3-5	278	286	294	306	318	336
3	6-9	277	285	293	305	317	335
4	10-19	276	283	292	303	316	333
5	20-35	274	280	290	300	314	330
6	36-49	272	277	288	297	312	327
7	50-79	271	275	287	295	311	325
8	80-149	270	274	286	294	310	324
9	Over 150	269	273	285	293	309	323

* Connecting picture of the measuring instrument
(On Automatic control)
Inside PATTERN is used when W/B is controlled. Connect to auto controller or push Adjustment R/C POWER ON -> Enter the mode of White-Balance, the pattern will come out.



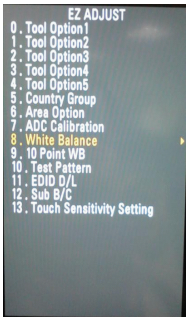
* Auto-control interface and directions
1) Adjust in the place where the influx of light like floodlight around is blocked. (illumination is less than 10 lux).
2) Adhere closely the Color Analyzer (CA210) to the module less than 10 cm distance, keep it with the surface of the Module and Color Analyzer’s prove vertically.(80° ~ 100°).
3) Aging time
- After aging start, keep the power on (no suspension of power supply) and heat-run over 5 minutes.
- Using ‘no signal’ or ‘full white pattern’ or the others, check the back light on.

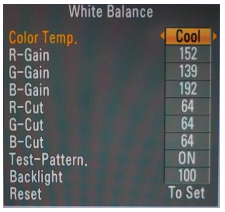
• Auto adjustment Map(RS-232C)
RS-232C COMMAND
[CMD ID DATA]
Wb 00 00 White Balance Start
Wb 00 ff White Balance End

	RS-232C COMMAND [CMD ID DATA]			MIN	CENTER (DEFAULT)			MAX
	Cool	Mid	Warm		Cool	Mid	Warm	
R Gain	jg	Ja	jd	00	172	192	192	192
G Gain	jh	Jb	je	00	172	192	192	192
B Gain	ji	Jc	jf	00	192	192	172	192
R Cut					64	64	64	128
G Cut					64	64	64	128
B Cut					64	64	64	128

** Caution **
Color Temperature : COOL, Medium, Warm.
One of R Gain/G Gain/ B Gain should be kept on 0xC0, and adjust other two lower than C0.
(when R/G/B Gain are all C0, it is the FULL Dynamic Range of Module)

* Manual W/B process using adjustment remote control.
• After enter Service Mode by pushing “ADJ” key,
• Enter White Balance by pushing “▶” key at “8. White Balance”.





* After you finished all adjustments, Press “In-start” key and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable. If it is not same, then correct it same with BOM and unplug AC cable. For correct it to the model’s module from factory Jig model.
* Push the “IN STOP” key after completing the function inspection. And Mechanical Power Switch must be set “ON”.

5.2. EYE-Q function check

Step 1) Turn on TV
Step 2) Press EYE key of Adjustment remote control.
Step 3) Cover the Eye Q II sensor on the front of the using your hand and wait for 6 seconds
Step 4) Confirm that R/G/B value is lower than 10 of the “Raw Data(Sensor data, Back light)”. If after 6 seconds, R/G /B value is not lower than 10, replace Eye Q II sensor.
Step 5) Remove your hand from the Eye Q II sensor and wait for 6 seconds.
Step 6) Confirm that “ok” pop up.
If change is not seen, replace Eye Q II sensor.

5.3. DDC EDID Write (RGB 128Byte)

- Connect D-sub Signal Cable to D-sub Jack.
- Write EDID Data to EEPROM(24C02) by using DDC2B protocol.
- Check whether written EDID data is correct or not.

* For Service main assembly, EDID have to be downloaded to Insert Process in advance.

5.4. DDC EDID Write (HDMI 256Byte)

- Connect HDMI Signal Cable to HDMI Jack.
- Write EDID Data to EEPROM(24C02) by using DDC2B protocol.
- Check whether written EDID data is correct or not.

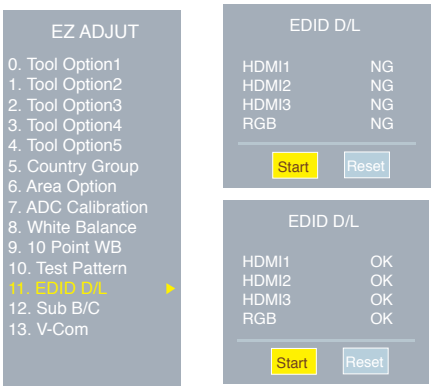
* For Service main assembly, EDID have to be downloaded to Insert Process in advance.

5.5. EDID DATA

1) All Data : HEXA Value
2) Changeable Data :
*: Serial No : Controlled / Data:01
**: Month : Controlled / Data:00
***:Year : Controlled
****:Check sum

- Auto Download

- After enter Service Mode by pushing “ADJ” key,
- Enter EDID D/L mode.
- Enter “START” by pushing “OK” key.



* Caution : Never connect HDMI & D-sub Cable when EDID download

* Edid data and Model option download (RS232)

Item	CMD1	CMD2	Data0		
Download ‘Mode In’	A	A	0	0	When transfer the ‘Mode In’, Carry the command.
Download	A	E	00	10	Automatically Download (The use of a internal pattern)

- Manual Download

* Caution
1) Use the proper signal cable for EDID Download.
- Analog EDID : Pin3 exists
- Digital EDID : Pin3 exists
2) Never connect HDMI & D-sub Cable at the same time.
3) Use the proper cables below for EDID Writing.
4) Download HDMI1, HDMI2, separately because HDMI1 is different from HDMI2.

For Analog EDID	For HDMI EDID
D-sub to D-sub	DVI-D to HDMI or HDMI to HDMI
	 

Item	Condition	Data(Hex)
Manufacturer ID	GSM	1E6D
Version	Digital : 1	01
Revision	Digital : 3	03

1) FHD RGB EDID data

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	a		b			
10	c		01	03	68	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	80	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	d			
70	d														00	e
80	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
90	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
A0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
B0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
C0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
D0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
E0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
F0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

2) FHD HDMI EDID data

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	a		b			
10	c		01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	71	4F	81	80	01	01	01	01	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	A0	5A	00	00	00	1E	1B	21	50	A0	51	00	1E	30
50	48	88	35	00	A0	5A	00	00	00	1C	00	00	00	FD	00	3A
60	3E	1E	53	10	00	0A	20	20	20	20	20	20	d			
70	d														01	e
80	02	03	26	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
90	22	15	01	26	15	07	50	09	57	07	f					
A0	f		E3	05	03	01	01	1D	80	18	71	1C	16	20	58	2C
B0	25	00	A0	5A	00	00	00	9E	01	1D	00	72	51	D0	1E	20
C0	6E	28	55	00	A0	5A	00	00	00	1E	02	3A	80	18	71	38
D0	2D	40	58	2C	45	00	A0	5A	00	00	00	1E	01	1D	00	BC
E0	52	D0	1E	20	B8	28	55	40	A0	5A	00	00	00	1E	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	e

* Detail EDID Options are below.

ⓐ Product ID

Model Name	HEX	EDID Table	DDC Function
ALL Model	0001	01 00	Analog/Digital

ⓑ Serial No: Controlled on production line.

ⓒ Month, Year: Week : '01' -> '01'
Year : '2011' -> '15' fix

ⓓ Model Name(Hex):

MODEL	MODEL NAME(HEX)
all	00 00 00 FC 00 4C 47 20 54 56 0A 20 20 20 20 20 20 20

ⓔ Checksum: Changeable by total EDID data.

ⓕ Vendor Specific(HDMI)

INPUT	MODEL NAME(HEX)
HDMI1	67030C001000B82D
HDMI2	67030C002000B82D
HDMI3	67030C003000B82D

5.6. Outgoing condition Configuration

When pressing "IN-STOP" key by Service remote control, Red LED are blinked alternatively. And then Automatically turn off. (Must not AC power OFF during blinking)

5.7. Hi-pot Test

Confirm whether is normal or not when between power board's ac block and GND is impacted on 1.5 kV(dc) or 2.2 kV(dc) for one second.

6. Model name & Serial number D/L

- Press "Power on" key of service remote control. (Baud rate : 115200 bps)
- Connect RS232 Signal Cable to RS-232 Jack.
- Write Serial number by use RS-232.
- Must check the serial number at the INSTART menu.

6.1. Signal TABLE

CMD	LENGTH	ADH	ADL	DATA_1	. . .	Data_n	CS	DELAY

CMD : A0h
LENGTH : 85~94h (1~16 bytes)
ADH : EEPROM Sub Address high (00~1F)
ADL : EEPROM Sub Address low (00~FF)
Data : Write data
CS : CMD + LENGTH + ADH + ADL + Data_1 +…+ Data_n
Delay : 20ms

6.2. Command Set

No.	Adjust mode	CMD(hex)	LENGTH(hex)	Description
1	EEPROM WRITE	A0h	84h+n	n-bytes Write(n=1~16)

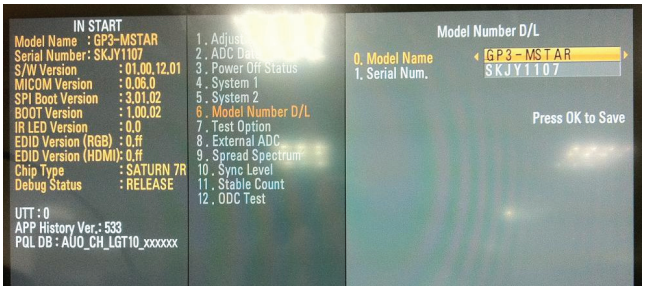
* Description
FOS Default write : <7mode data> write
Vtotal, V_Frequency, Sync_Polarity, Htotal, Hstart, Vstart, 0, Phase
Data write : Model Name and Serial Number write in EEPROM,.

6.3. Method & notice

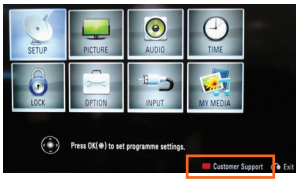
A. Serial number D/L is using of scan equipment.
B. Setting of scan equipment operated by Manufacturing Technology Group.
C. Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0.

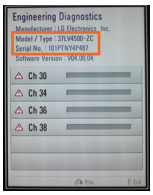
* Manual Download (Model Name and Serial Number)
If the TV set is downloaded by OTA or Service man, sometimes model name or serial number is initialized.(Not always)
There is impossible to download by bar code scan, so It need Manual download.

1) Press the 'Instart' key of Adjustment remote control.
2) Go to the menu '6.Model Number D/L' like below photo.
3) Input the Factory model name(ex 37LV4500-ZC) or Serial number like photo.

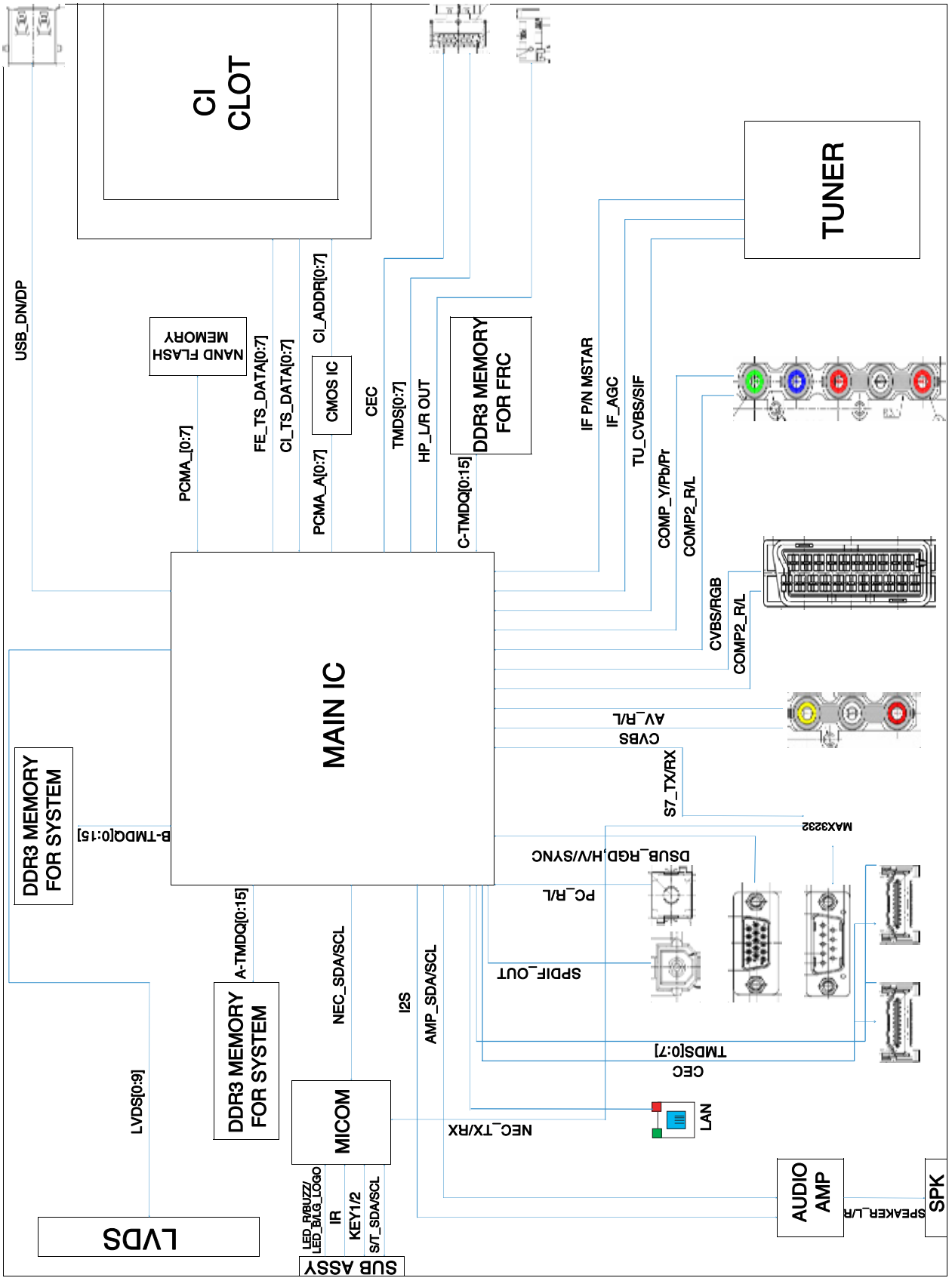


4) Check the model name Instart menu. -> Factory name displayed. (ex 37LV4500-ZC)
5) Check the Diagnostics. (DTV country only) -> Please press Customer Support at the menu.





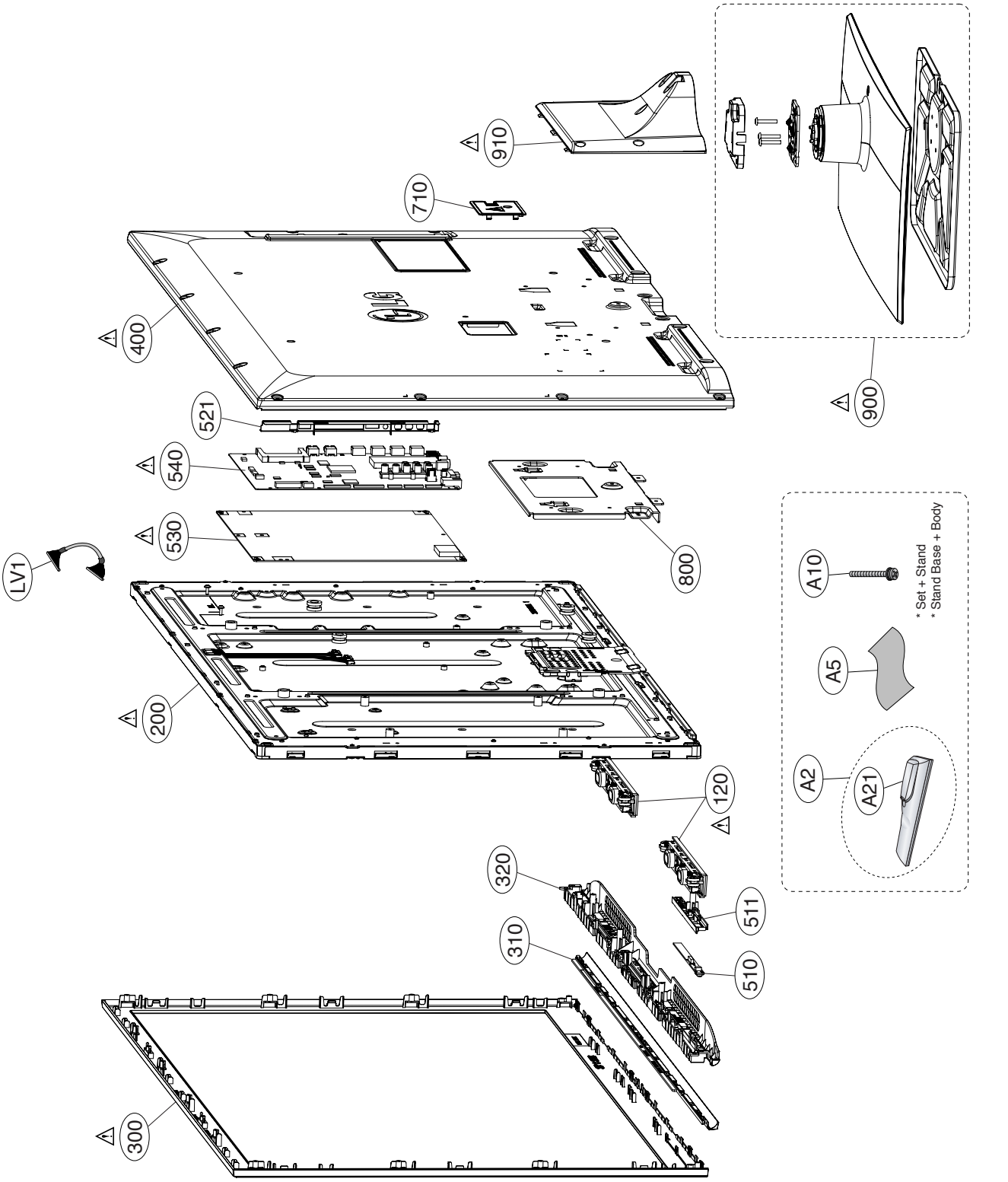
BLOCK DIAGRAM



EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.



S7M-PLUS_DivX_MS10

LGE107DC-RP [S7M+ DIVX/MS10]

NAND FLASH MEMORY

IC102
NAND01GW3B2CN6E
NAND_FLASH_1G_NUMONYX
EAN60762401

/PF_CE0
H : Serial Flash
L : NAND Flash
/PF_CE1
H : 16 bit
L : 8 bit

+3.3V_Normal
/F_RB
/PF_OE
/PF_CE0
/PF_CE1
/PF_ALE
/PF_WE
/PF_WP
/PF_WP
PCM_A[0-7]
AR101
AR102
22
R107 1K
R108 3.9K
R103 3K
R104 10K
R105 1K OPT
R106 1K
R102 5.1K
C101 0.1uF
C102 10uF
C103 0.1uF
Q101 KRC103S OPT

<T3 CHIP Config(AUD_LRCH)>

Boot from SPI flash : 1'b0
Boot from NOR flash : 1'b1

<T3 CHIP Config>
(AUD_SCK, AUD_MASTER_CLK, PWM1, PWM0)

MIPS_no_EJ_NOR8 : 4'h3 (MIPS as host. No EJ PAD. Byte mode NAND flash.)
MIPS_EJ1_NOR8 : 4'h4 (MIPS as host. EJ use PAD1. Byte mode NAND flash.)
MIPS_EJ2_NOR8 : 4'h5 (MIPS as host. EJ use PAD2. Byte mode NAND flash.)
B51_Secure_no scramble : 4'hb (8051 as host. Internal SPI flash secure boot, no scramble)
B51_Sesure_scramble : 4'hc (8051 as host. Internal SPI flash secure boot with scarmble)

+3.3V_Normal
AUD_MASTER_CLK
R148 56
C112 100pF 50V
R115 1K OPT
R117 1K
R123 1K OPT
R125 1K OPT
R116 10K OPT
R118 10K OPT
R121 1K
R124 1K OPT
R126 1K
AUD_LRCH
AUD_SCK
AUD_MASTER_CLK_0
PWM1
PWM0

IC101

PCM_D[0-7]
PCM_A[0-14]
/PCM_REG
/PCM_OE
/PCM_WE
/PCM_IORD
/PCM_IOWR
/PCM_CE
/PCM_IRQA
/PCM_CD
/PCM_WAIT
PCM_RST
+5V_Normal
R132 10K
R133 10K
C108 0.1uF OPT
C109 0.1uF
AR104
AR103
22
/PF_CE0
/PF_CE1
/PF_OE
/PF_WE
PF_ALE
/PF_WP
/F_RB

PCM_D0 U22
PCM_D1 T21
PCM_D2 T22
PCM_D3 AB18
PCM_D4 AC18
PCM_D5 AC19
PCM_D6 AC20
PCM_D7 AC21
PCM_A0 U21
PCM_A1 V21
PCM_A2 Y22
PCM_A3 AA22
PCM_A4 R22
PCM_A5 R21
PCM_A6 T23
PCM_A7 T24
PCM_A8 AA23
PCM_A9 Y20
PCM_A10 AB17
PCM_A11 AA21
PCM_A12 U23
PCM_A13 Y23
PCM_A14 W23
PCM_REG_N W22
PCM_OE_N AA17
PCM_WE_N V22
PCM_IORD_N W21
PCM_IOWR_N Y21
PCM_CE_N AA20
PCM_IRQA_N V23
PCM_CD_N P23
PCM_WAIT_N R23
PCM_RESET P22
PCM_PF_CE0Z AC17
PCM_PF_CE1Z AB20
PCM_PF_OEZ AA18
PCM_PF_WEZ AB21
PCM_PF_ALE AB19
PCM_PF_AD[15] AD17
PCM_PF_RBZ AA19

S7_NEC_TXD
S7_NEC_RXD
R134 22
R135 22
UART_TX2/GPIO65 M23
UART_RX2/GPIO64 N23
for SYSTEM/HDCP EEPROM&URSA3
I2C_SDA
I2C_SCL
R136 22
R137 22
DDCR_DA/GPIO71 M22
DDCR_CK/GPIO72 N22
RGB_DDC_SDA
RGB_DDC_SCL
R138 22
R139 22
DDCA_DA/UART0_TX A5
DDCA_CK/UART0_RX B5
TO SCART1
PWM0
PWM1
PWM2
SC_RE2
SC_RE1
PWM0/GPIO66 K23
PWM1/GPIO67 K22
PWM2/GPIO68 G23
PWM3/GPIO69 G22
PWM4/GPIO70 G21
DSUB_DET C6
MODEL_OPT_3 B6
PCM_5V_CTL C8
/RST-PHY C7
3D SG M_RFModule_RESET A6
SAR0/GPIO31
SAR1/GPIO32
SAR2/GPIO33
SAR3/GPIO34
SAR4/GPIO35

GPIO143/TCON0 N21
GPIO145/TCON2 M21
GPIO147/TCON4 L22
GPIO149/TCON6 L21
GPIO151/TCON8 P21
5V_DET_HDMI_1
5V_DET_HDMI_2
5V_DET_HDMI_4
SIDEAV_DET

GPIO36/UART3_RX K21
GPIO37/UART3_TX L23
GPIO38 K20
GPIO39 L20
GPIO40 M20
GPIO41 G20
GPIO42 G19
M_REMOTE_RX 3D SG
M_REMOTE_TX 3D SG
ET_RXER
FRC_RESET
SC1/COMP1_DET
ERROR_OUT
MODEL_OPT_0

GPIO50/UART1_RX F20
GPIO51/UART1_TX F19
DC_MREMOTE 3D SG
DD_MREMOTE 3D SG

GPIO6/PM0/INT0 E7
GPIO7/PM1/PM_UART_TX D7
GPIO8/PM2 E11
GPIO9/PM3 G9
GPIO10/PM4 F9
GPIO11/PM5/PM_UART_RX/INT1 C5
PM_SPI_CS1/GPIO12/PM6 E8
PM_SPI_WP1/GPIO13/PM7 E9
PM_SPI_WP2/GPIO14/PM8/INT2 F7
GPIO15/PM9 F6
PM_SPI_CS2/GPIO16/PM10 D8
GPIO17/PM11/INT3 G12
GPIO18/PM12/INT4 F10
R146 33
USB1_OCD
USB1_CTL
HP_DET
CONTROL_ATTEN
MODEL_OPT_6
MODEL_OPT_1
/FLASH_WP
MODEL_OPT_2
TUNER_RESET
DEMOD_RESET
AV_CVBS_DET

PM_SPI_CK/GPIO1 D9
GPIO0/PM_SPI_CZ D11
PM_SPI_DI/GPIO2 E10
PM_SPI_DO/GPIO3 D10
R147 33
R151 33
SPI_SCK
/SPI_CS
SPI_SDI
SPI_SDO
for SERIAL FLASH

TS0_CLK AA9
TS0_VLD AA5
TS0_SYNC AA10
CI_TS_CLK
CI_TS_VAL
CI_TS_SYNC
CI_TS_DATA[0-7]
from CI SLOT

CI_TS_DATA[0] AB5
CI_TS_DATA[1] AC4
CI_TS_DATA[2] Y6
CI_TS_DATA[3] AA6
CI_TS_DATA[4] W6
CI_TS_DATA[5] AA7
CI_TS_DATA[6] Y9
CI_TS_DATA[7] AA8
TS0_D0
TS0_D1
TS0_D2
TS0_D3
TS0_D4
TS0_D5
TS0_D6
TS0_D7

TS1_CLK AC5
TS1_VLD AC6
TS1_SYNC AB6
FE_TS_CLK
FE_TS_VAL_ERR
FE_TS_SYNC
FE_TS_DATA[0-7]
Internal demod out
/External demod in

FE_TS_DATA[0] AC10
FE_TS_DATA[1] AB10
FE_TS_DATA[2] AC9
FE_TS_DATA[3] AB9
FE_TS_DATA[4] AC8
FE_TS_DATA[5] AB8
FE_TS_DATA[6] AC7
FE_TS_DATA[7] AB7
TS1_D0
TS1_D1
TS1_D2
TS1_D3
TS1_D4
TS1_D5
TS1_D6
TS1_D7

MPIF_CLK D12
MPIF_CS_N D14
MPIF_BUSY E14
R160 1K
Delete /PIF_SPI_CS
MPIF_D0 E12
MPIF_D1 F12
MPIF_D2 D13
MPIF_D3 E13

NAND_FLASH_1G_HYNIX

EAN35669102
IC102-*1
H27U1G8F2BTR-BC

NAND_FLASH_1G_SS

EAN61857001
IC102-*2
K9F1G08U0D-SCB0

NAND_FLASH_1G_TOSHIBA

EAN61508001
IC102-*3
TC58NVG0S3ETA0BBBH

NC_1 NC_2 NC_3 NC_4 NC_5 NC_6 R/B RE CE NC_7 NC_8 VCC_1 VSS_1 NC_9 NC_10 CLE ALE WE WP NC_11 NC_12 NC_13 NC_14 NC_15
NC_29 NC_28 NC_27 NC_26 I/O7 I/O6 I/O5 I/O4 NC_25 NC_24 NC_23 VCC_2 VSS_2 NC_22 NC_21 NC_20 I/O3 I/O2 I/O1 I/O0 NC_19 NC_18 NC_17 NC_16
RY/BY

S7R

S7R_BASIC S7R_MS10 S7R_DivX S7R_DivX_MS10 S7R_RM

S7MR

S7MR_BASIC S7MR_MS10 S7MR_DivX S7MR_DivX_MS10 S7MR_RM

S7MR-PLUS

S7M-PLUS_BASIC S7M-PLUS_MS10 S7M-PLUS_DivX S7M-PLUS_RM

IC103-*1
CAT24C08WI-GT3-H-RECV(TV)
HDCP_EEPROM_ON_SEMI_NEW

EEPROM_1MBIT_ATMEL
IC104-*1
AT24C1024BN-SH-T

HDCP EEPROM

HDCP_EEPROM_CATALYST_OLD
IC103
CAT24WC08W-T
+3.3V_Normal
Addr:10101--
A0 A1 A2 VSS VCC WP SCL SDA
R113 4.7K
R127 4.7K
C107 0.1uF
R128 22
R129 22
I2C_SCL
I2C_SDA

EEPROM

EEPROM_1MBIT_ST
IC104
M24M01-HRMN6TP
+3.3V_Normal
C105 0.1uF
A0'h
R111 22
R112 22
C104 8pF OPT
C106 8pF OPT

I2C

+3.3V_Normal
R140 4.7K
R141 4.7K
R142 2.2K
R143 2.2K
R144 2.2K
R145 2.2K
AMP_SDA
AMP_SCL
I2C_SDA
I2C_SCL
NEC_SDA
NEC_SCL

DIMMING

A_DIM
PWM_DIM
R156 10K
R157 100
R155 0 OPT
C111 2.2uF
PWM0
PWM2
LD650 Scan
SCAN_BLK2
SCAN_BLK1/OPC_OUT
R158 100 OPT
R159 100 OPT
FRC_PWM1
FRC_PWM0

FRC_SCL
FRC_SDA

THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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LG ELECTRONICS

MODEL	GP3_Saturn7M	DATE	Ver. 0.1
BLOCK	FLASH/EEPROM/GPIO	SHEET	1

MODEL OPTION

PIN NAME	PIN NO.	LOW	HIGH
MODEL_OPT_0	G19	NO FRC	FRC_HW_OPT
MODEL_OPT_4	E18	50/60Hz LVDS	100/120Hz LVDS
MODEL_OPT_1	C5	PHM_OFF	PHM_ON
MODEL_OPT_2	F7	NON_DVB_T2	DVB_T2
MODEL_OPT_3	B6	HD	FHD
MODEL_OPT_5	D18	Ready	default
MODEL_OPT_6	F9	LCD	OLED

	OPT_0	OPT_4
NO_FRC	: LOW	LOW
U3_INTERNAL	: HIGH	LOW
U5_EXTERNALBOOT	:HIGH	HIGH
reserved for FRC	: LOW	HIGH

--> This option is only applied in EU.
In case of NON_EU, default value set LOW.

->In case of GP2, This port was used for GIP/NON_GIP

--> MODEL_OPT_5, MODEL_OPT_6
: Only 3D_SG GPIO OUTPUT CONTROL

RSDS Power OPT

VDDC 1.26V

Normal Power 3.3V

Normal 2.5V

DDR3 1.5V

RSDS Power OPT

S7M-PLUS_DivX_MS10 IC101 LGE107DC-RP [S7M+ DIVX/MS10]

Close to MSTAR

Delete CHB_CVBS_IN

Close to MSTAR

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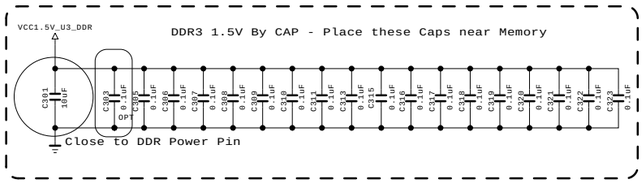
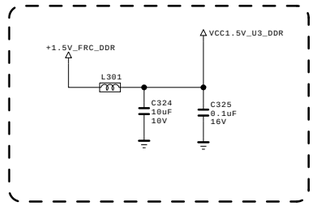
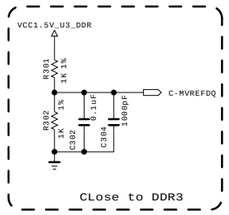
SECRET
LGElectronics

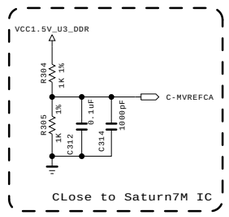
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	MAIN2, HW OPT	SHEET	2 /



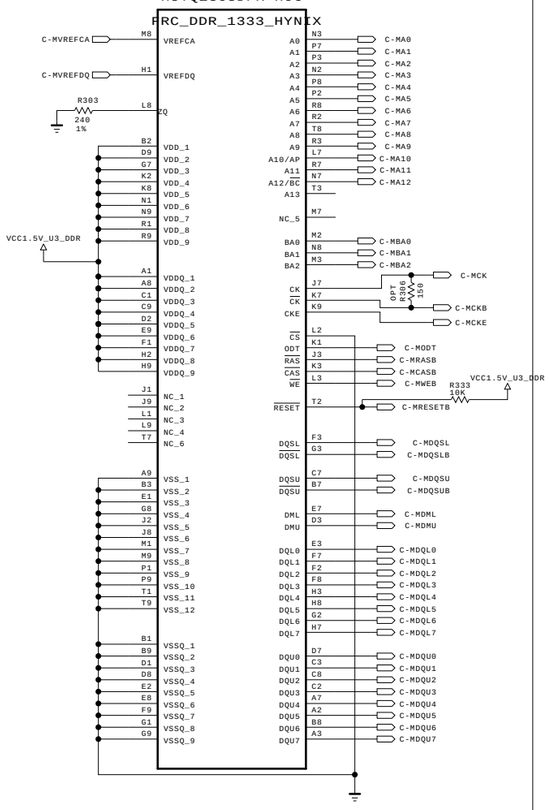


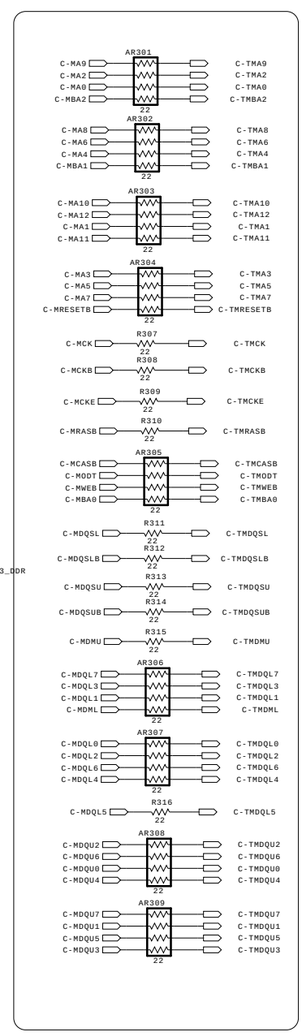




EAN61828901

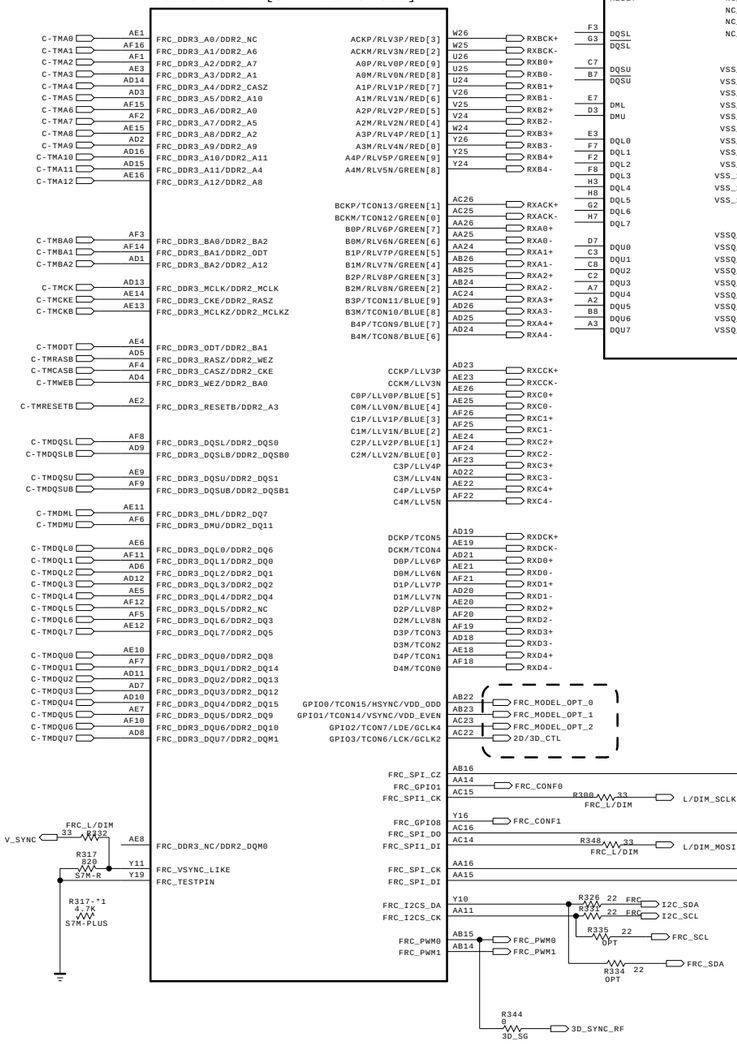
IC301
H5TQ1G63DFR-H9C





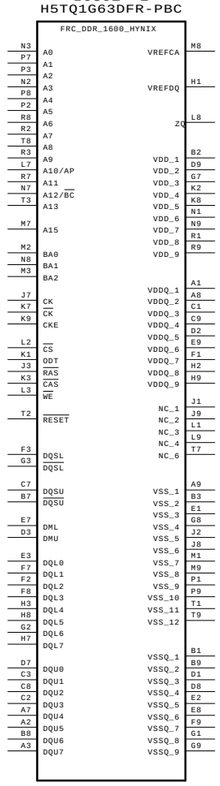
S7M-PLUS_DivX_MS10

IC101
LGE107DC-RP [S7M+ DIVX/MS10]



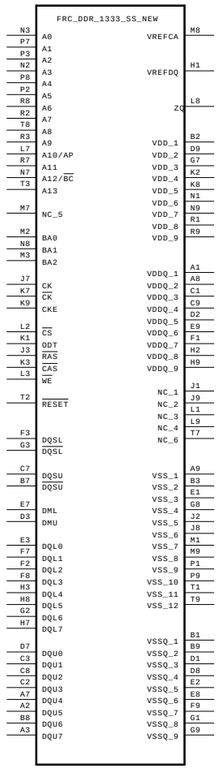
EAN61829001

IC301-*2
H5TQ1G63DFR-PBC



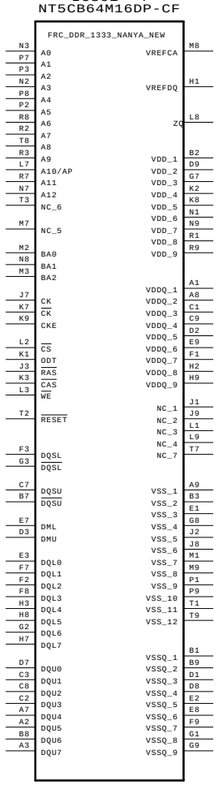
EAN61857101

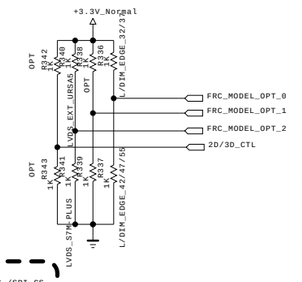
IC301-*3
K4B1G1646G-BCH9

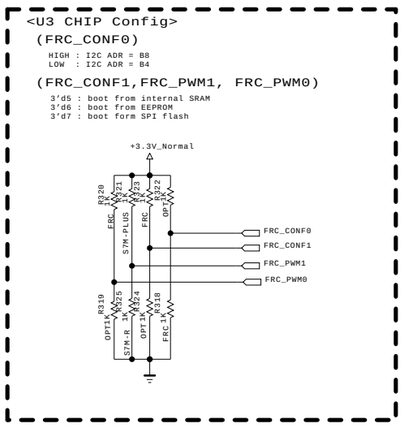


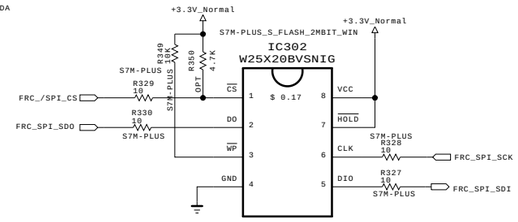
EAN61857201

IC301-*4
NT5CB64M16DP-CF









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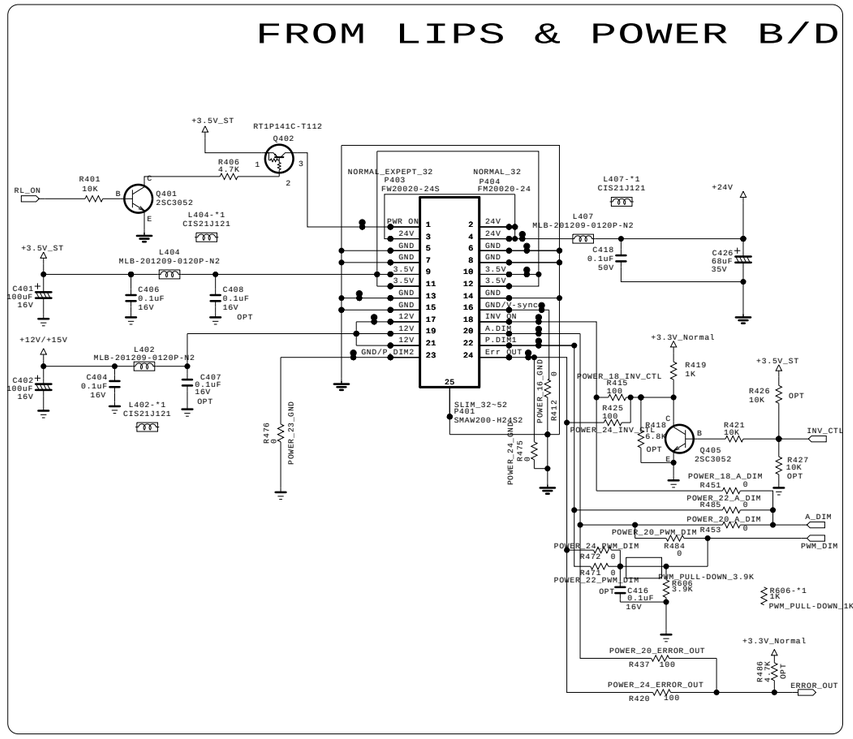
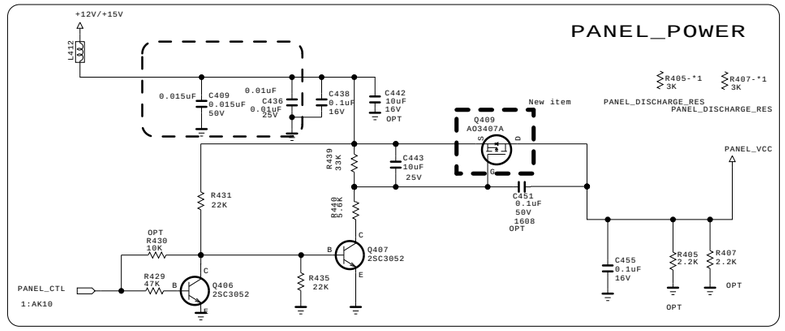
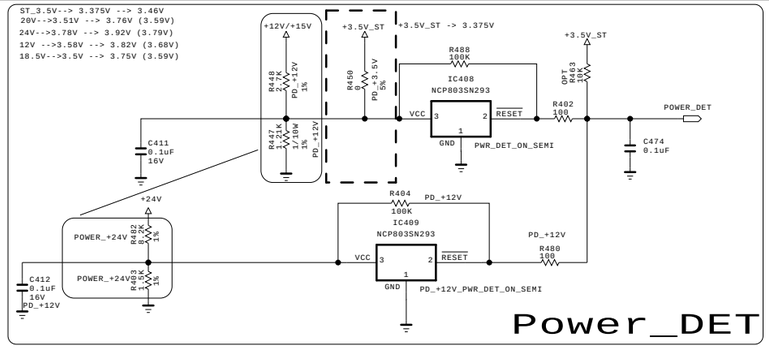
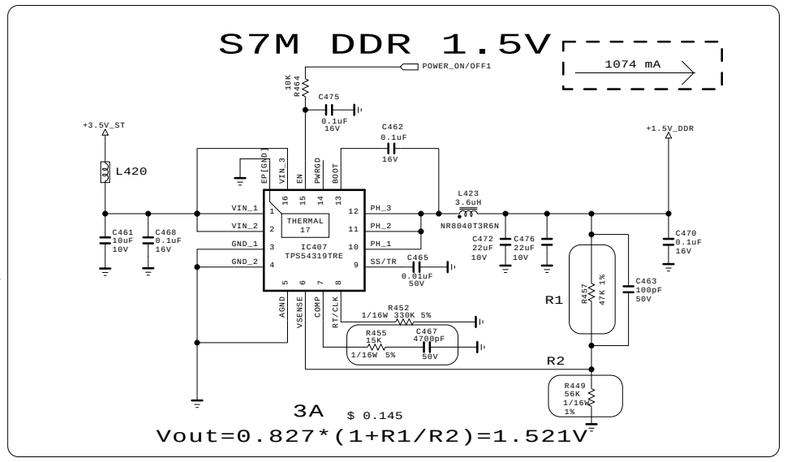
LG ELECTRONICS

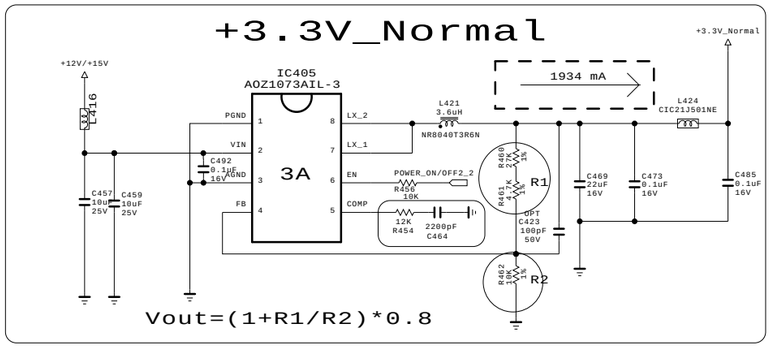
MODEL	GP2R	DATE	20101023
BLOCK	FRC_DDR	SHEET	3

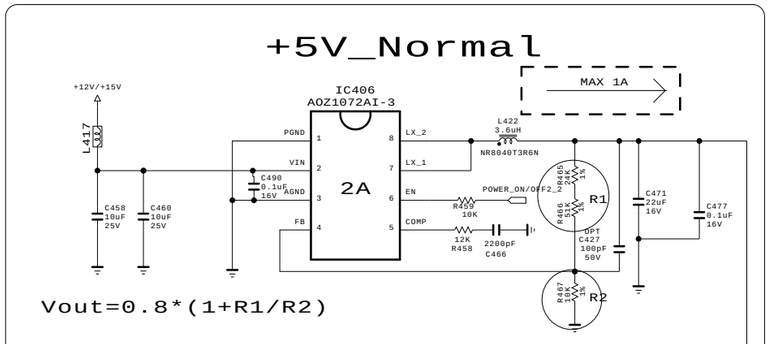


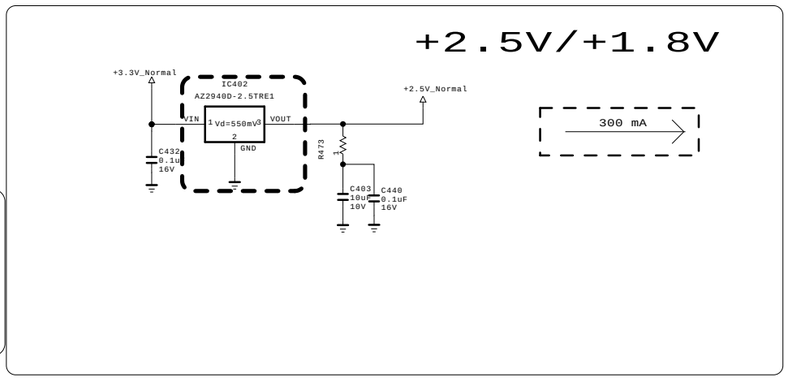


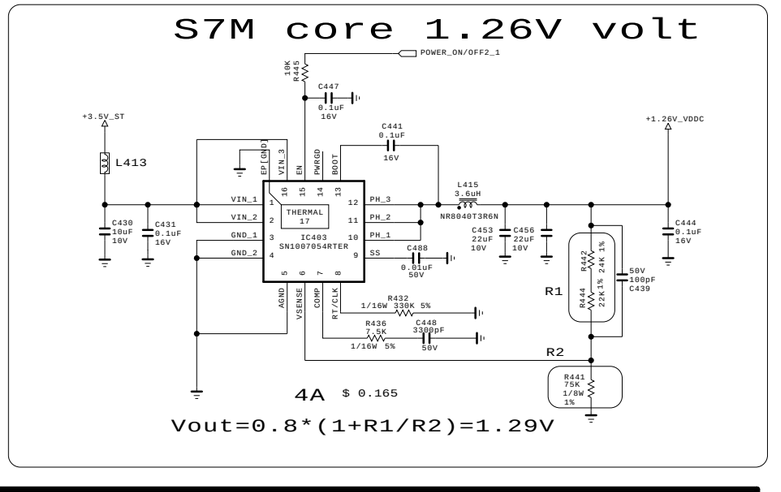


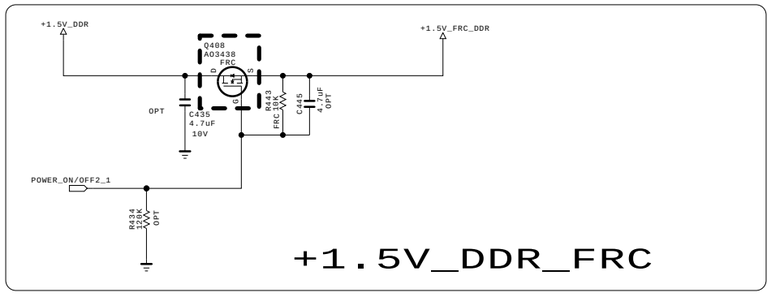


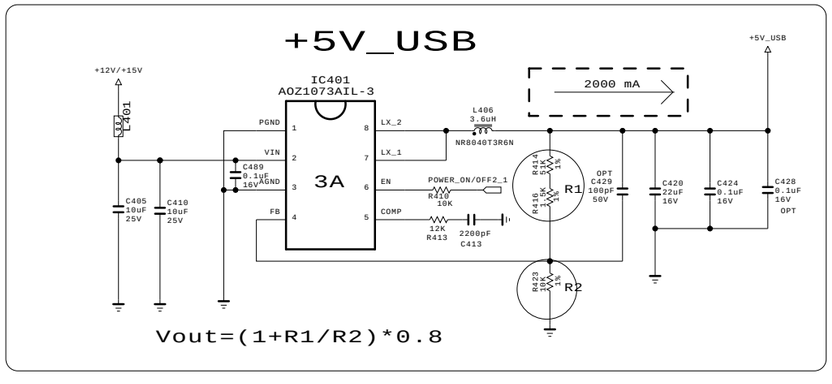












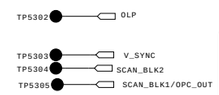
<MODULE PIN MAP>

PIN No	LGD(PSU) or LIPS	CM010"Lamp (PSU)	AU0 10"Lamp (PSU)	SHARP (PSU)	IPS-@ (PSU)
16	GND	GND	GND	GND	GND
18	INV_ON	A-DIM	INV_ON	INV_ON	INV_ON
20	VBR-A	NC	Err_out	52/60:ERROR 26/32HD:NC	Err_out
22	PWM_DIM	PWM_DIM	NC	26/32/52:PWM 60:NC	NC
24	Err_out	INV_ON	PWM_DIM	26/32/52:GND 60:PWM	PWM_DIM
23	GND	GND	GND	GND	GND

<LED MODULE PIN MAP -> latest update 20100618>

PIN No	LGD LPB/ OS LPB	32LE5300-TA CMO10"LED (PSU)	32LE4580-TA AUO 10"LED (PSU)	32LE5300-TA LGD 10"LED (PSU)	
16	NC	NC	NC	NC	
18	INV_ON	INV_ON	INV_ON	INV_ON	
20	NC	err_out --> NC	err_out --> NC	NC	
22	PWM_DIM	NC	NC	PWM_DIM	
24	err_out --> NC	PWM_DIM	PWM_DIM	err_out --> NC	
23	NC	NC	NC	NC	

LGD edge led error-out use or not? checking is necessary...



<Module Inv to Main Pin Connection>

INV	<-->	MAIN
#11	<-->	#24
#12	<-->	#18
#13	<-->	#20
#14	<-->	#22

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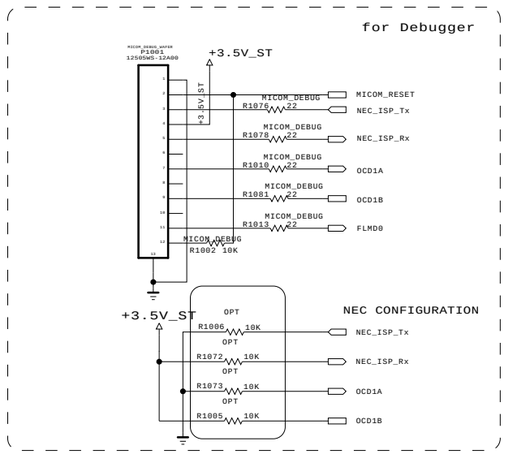
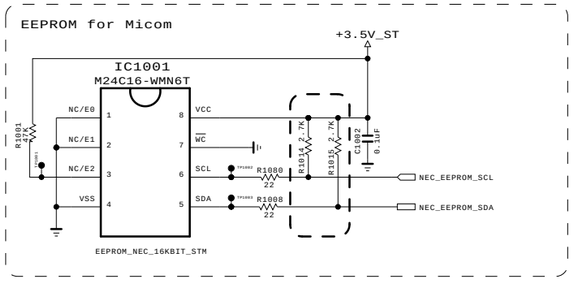
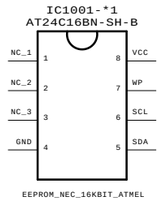
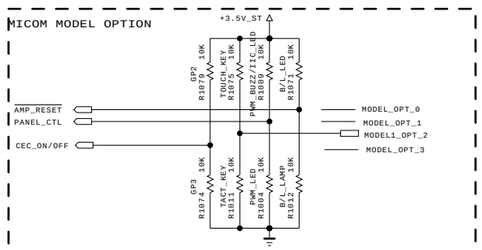
LG ELECTRONICS

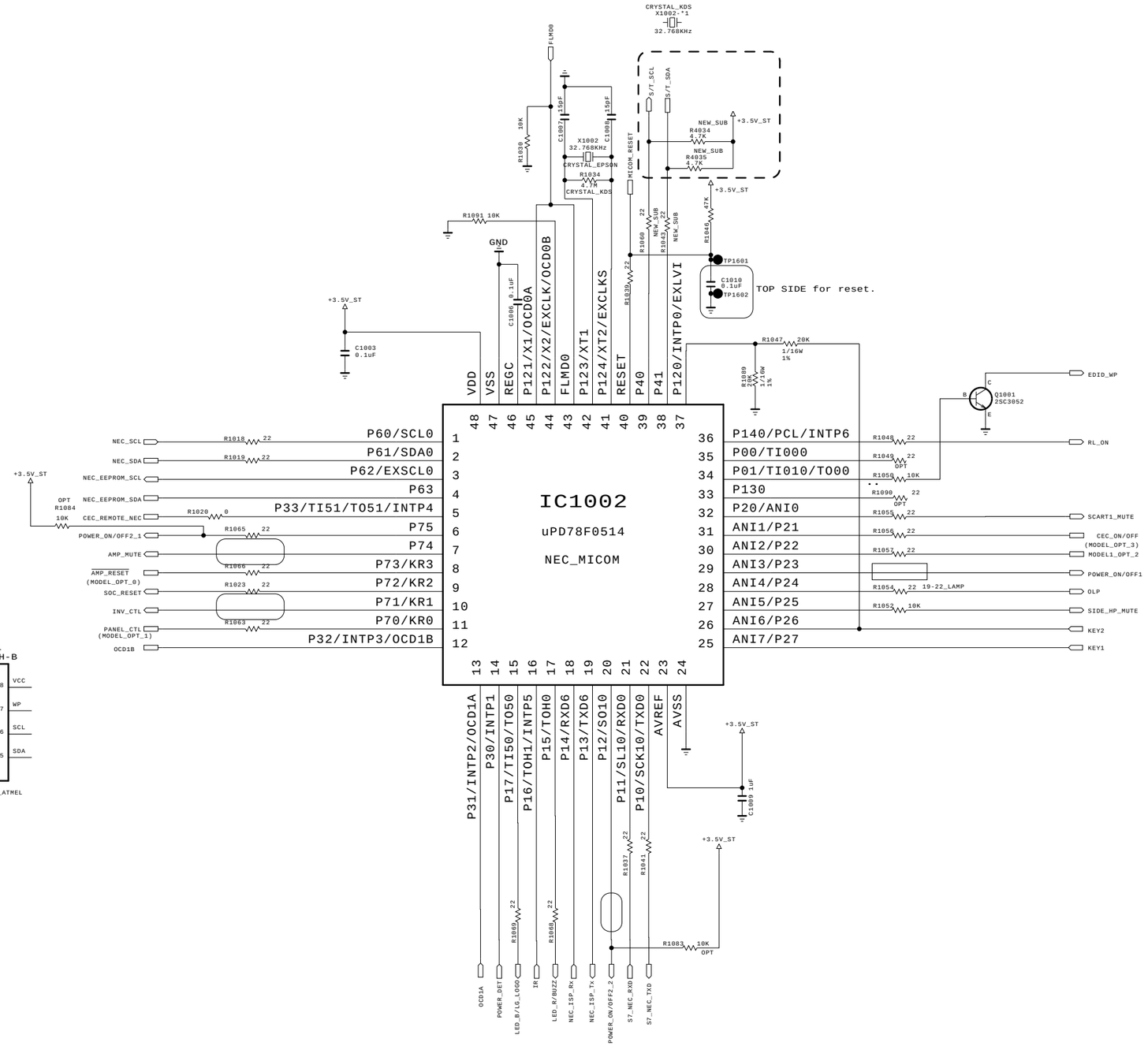
MODEL	GP2R	DATE	20101023
BLOCK	POWER_LARGE	SHEET	4 /











2011Y,GP2R, 101125 Update

MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	8	B/L_LED	B/L_LAMP
MODEL_OPT_1	11	PWM_BUZZ/IIC_LED	PWM_LED
MODEL_OPT_2	30	TOUCH_KEY	TACT_KEY
MODEL_OPT_3	31	GP2	GP3

PWM_BUZZ/IIC_LED :Using IIC for LED Breathing & PWM Buzz
PWM_LED : Using PWM Signal for LED Lighting

MODEL_OPT_0	MODEL_OPT_1	MODEL_OPT_2	MODEL_OPT_3	Description
LOW	LOW	LOW	LOW	LK330/LK430 for KR/US 10Y EYE-Q Sensor KEY & PWM LED & No Buzz & No LED Blink
LOW	LOW	LOW	HIGH	LK330/LK430/LK530 KEY & PWM LED & No Buzz & No LED Blink
LOW : LED HIGH : LAMP	HIGH	HIGH	LOW	LV25/LV35/LV45/LW45/LV55/LK45/LK55 S/T & IIC LED & NO BUZZ & LED Blink
	HIGH	LOW	LOW	TBD IIC LED(09Y IIC Protocol) & No BUZZ
	Low	HIGH	LOW	TBD S/T & IIC LED & No Buzz & LED Blink

2010Y,GP2

MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	8	B/L_LED	B/L_LAMP
MODEL_OPT_1	11	PWM_BUZZ/IIC_LED	PWM_LED
MODEL_OPT_2	30	TOUCH_KEY	TACT_KEY
MODEL_OPT_3	31	GPIO_LED	NON_GPIO_LED

PWM_BUZZ/IIC_LED : For model that use LED Lighting used IIC
PWM_LED : For model that use LED Lighting used PWM Signal

MODEL_OPT_0	MODEL_OPT_1	MODEL_OPT_2	MODEL_OPT_3	
LOW	LOW	LOW	LOW	LD350/450/550 PWM LED & No Buzz & No LED Blink
HIGH	LOW	HIGH	LOW	19/22/26LE5300/5300 IIC LED & PWM IIC BUZZ
HIGH	HIGH	HIGH	LOW	32/37/42/47/55LE5300 IIC LED & PWM BUZZ
LOW	HIGH	LOW	LOW	LD420 IIC LED(09Y IIC Protocol) & No BUZZ
HIGH	LOW	LOW	HIGH	LE7300 GPIO LED & NO BUZZ

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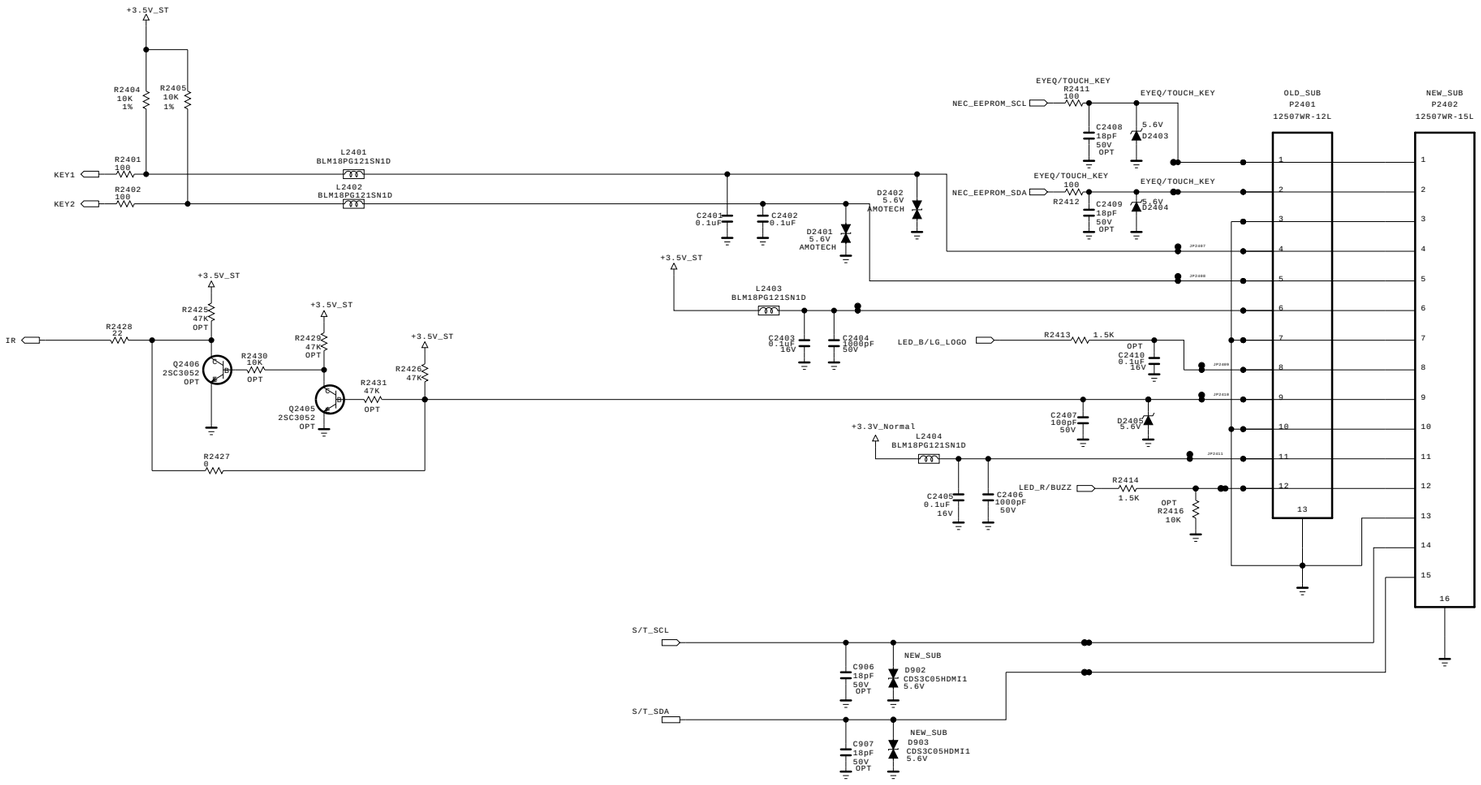
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101125
BLOCK	MICOM Rev.4	SHEET	5

CONTROL
IR & LED



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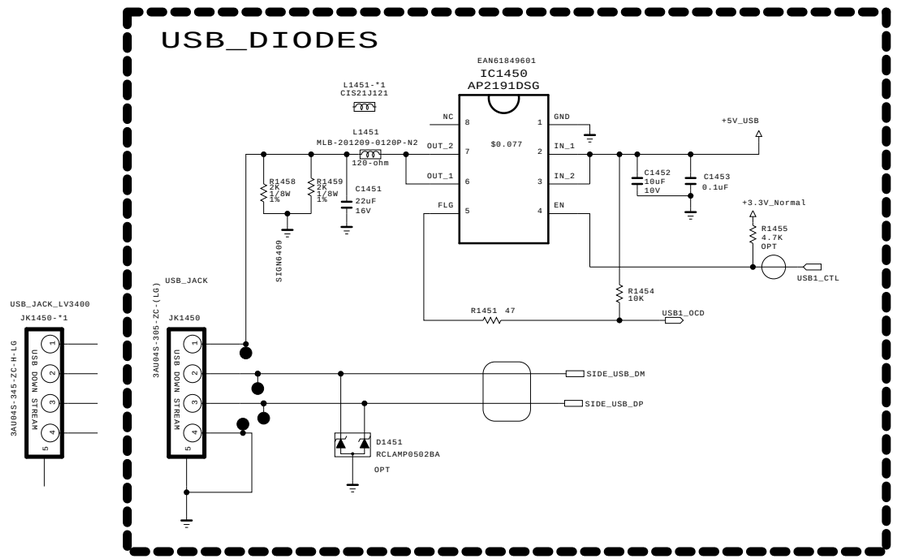
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	IR/CONTROL-L	SHEET	6 /



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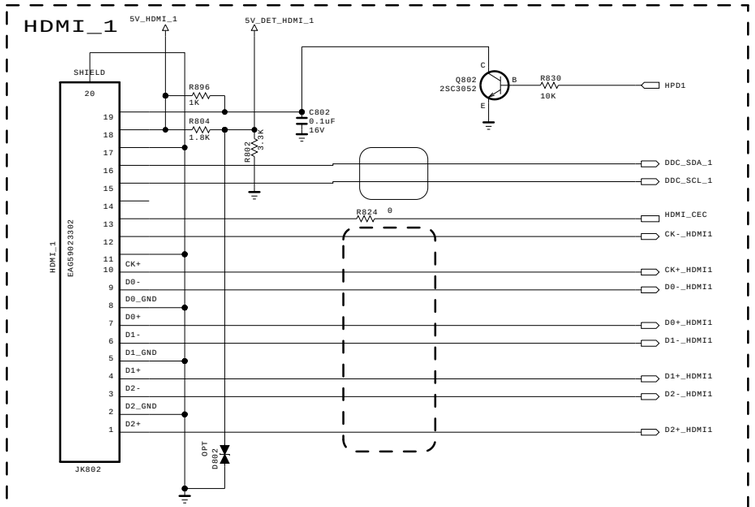
SECRET
LGElectronics

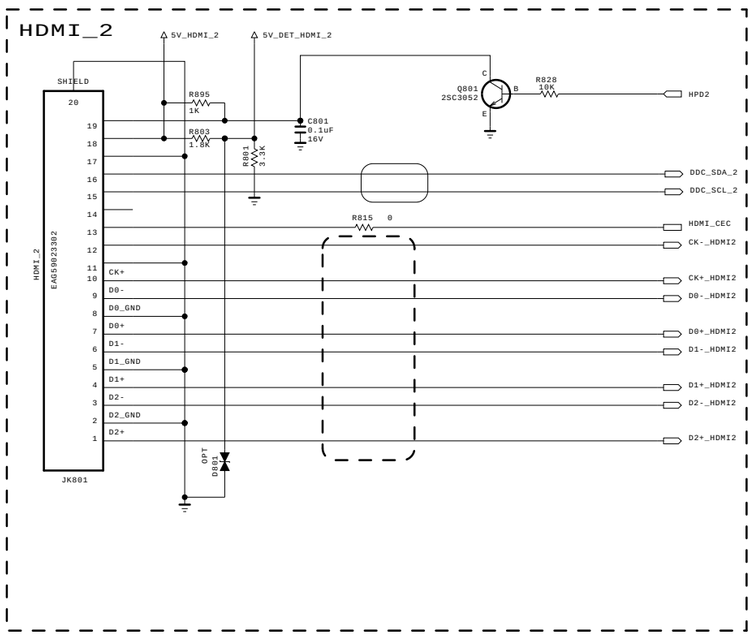
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	USB_OCP_DIODE	SHEET	7 /

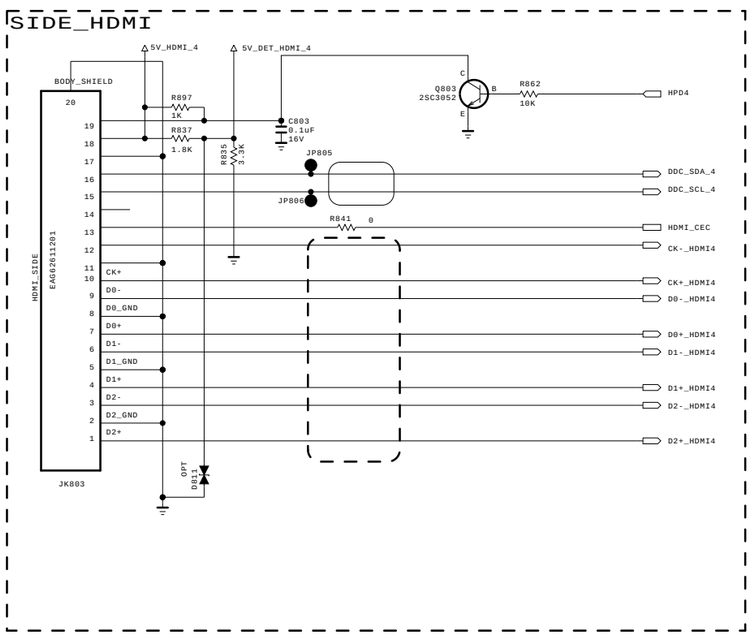
HDMI_1



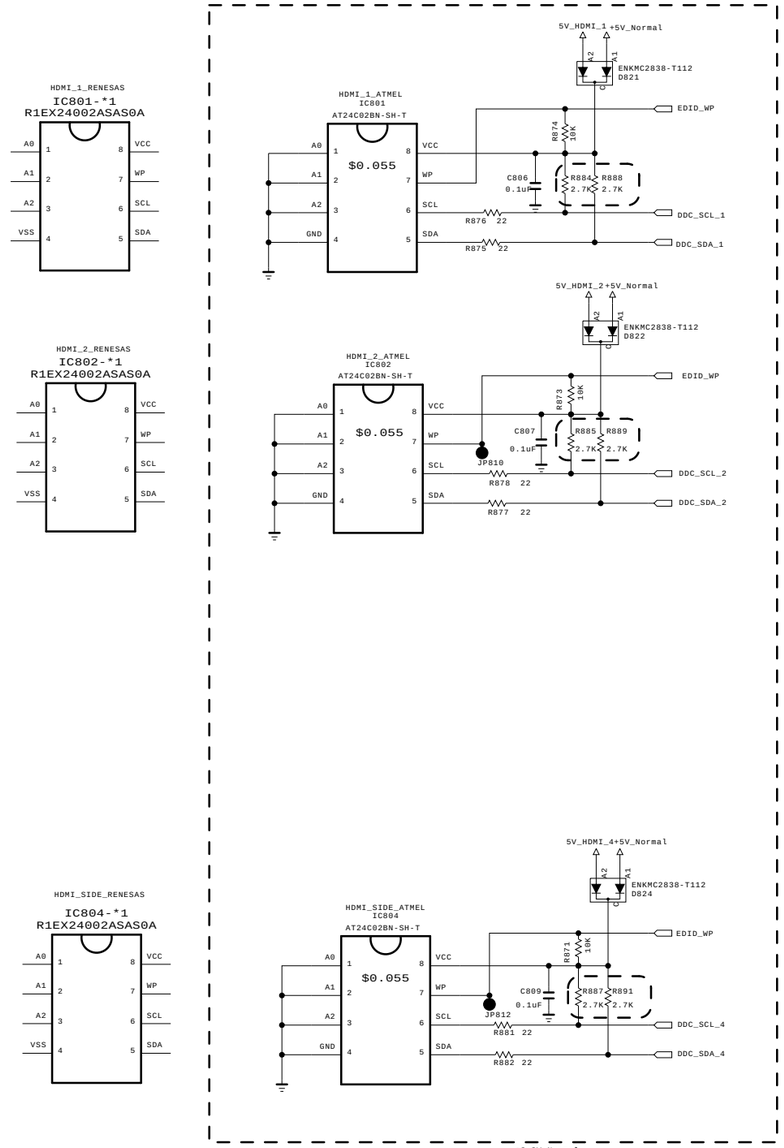
HDMI_2



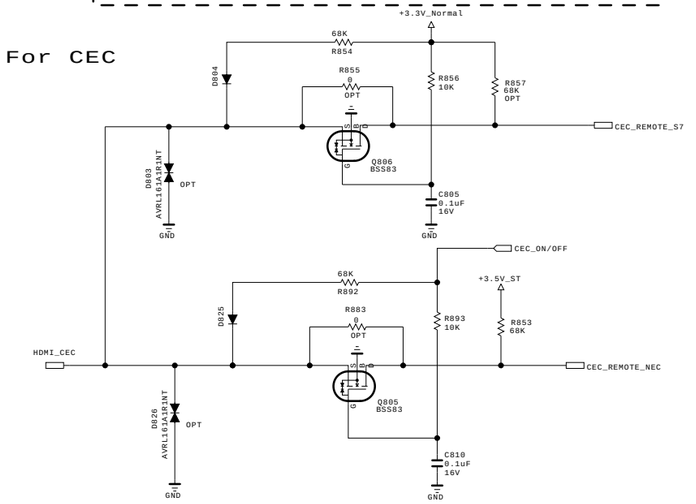
SIDE_HDMI



HDMI EEPROM



For CEC



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SECRET
LGElectronics

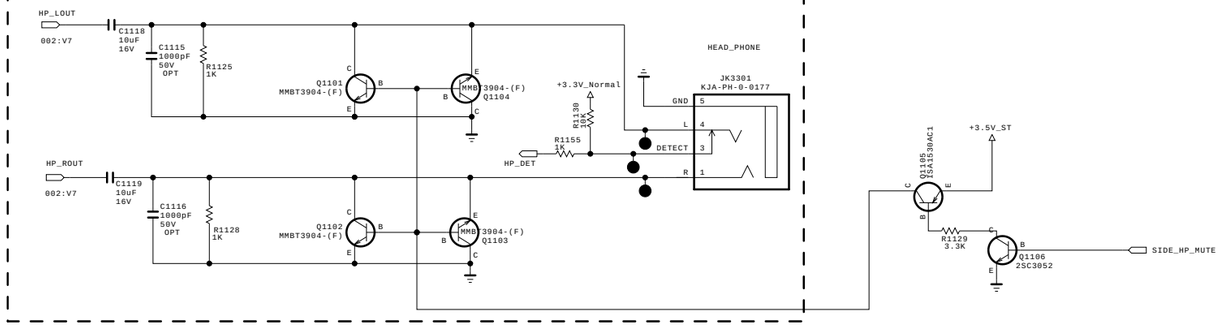
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	HDMI	SHEET	8 /

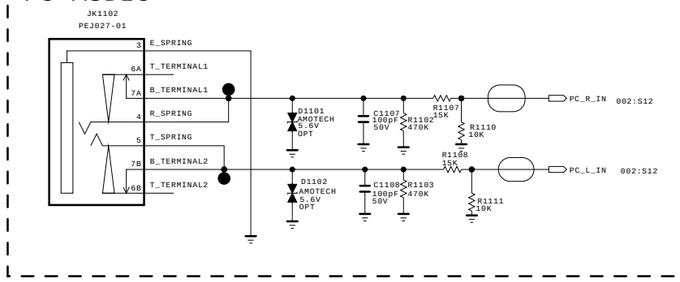
RGB/SPDIF/PC/HP

New Item Development

EARPHONE BLOCK

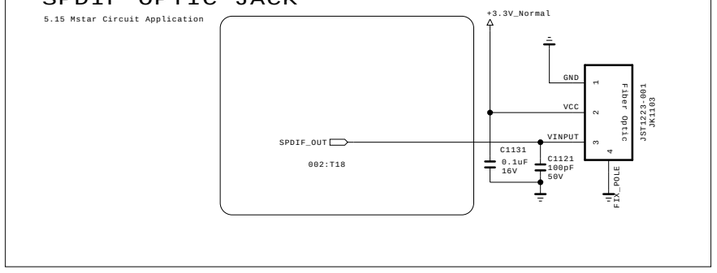


PC AUDIO

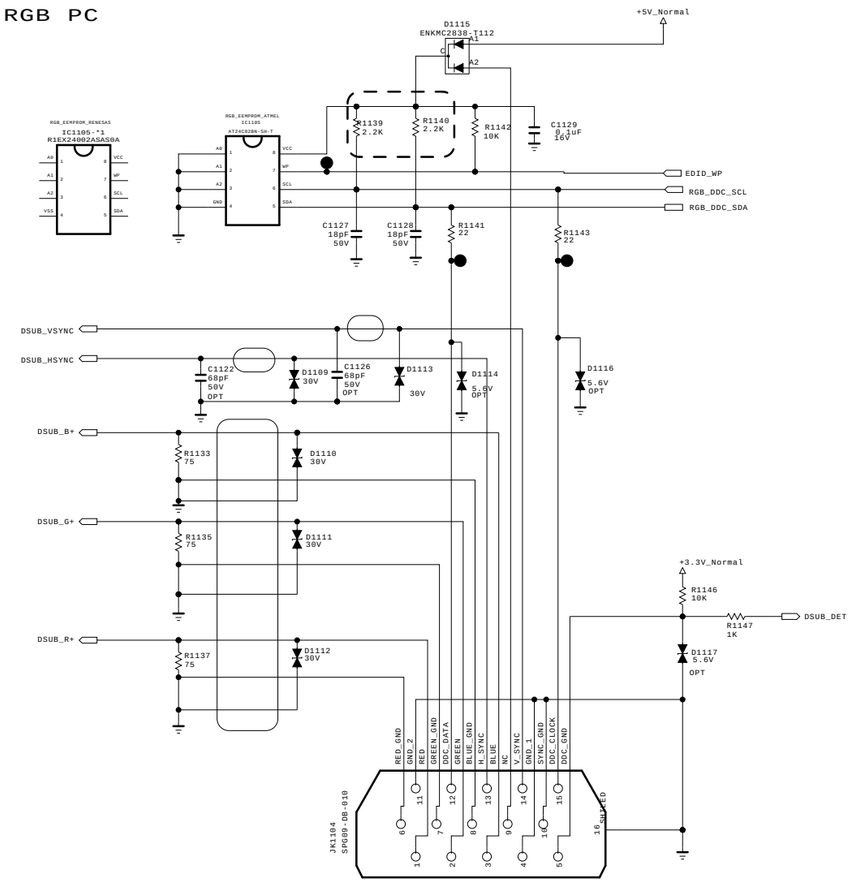


SPDIF OPTIC JACK

5.15 Mstar Circuit Application



RGB PC



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SECRET
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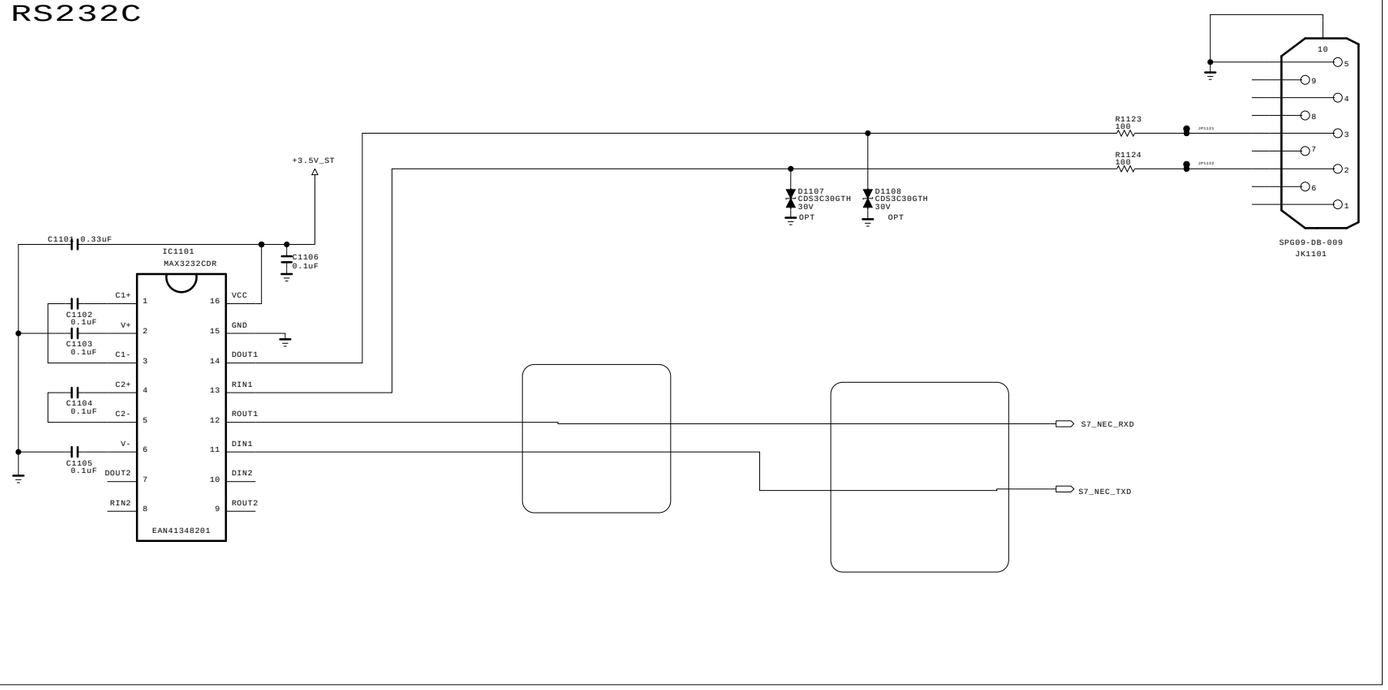
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	RGB/SPDIF/HP	SHEET	9

RS232C



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SECRET
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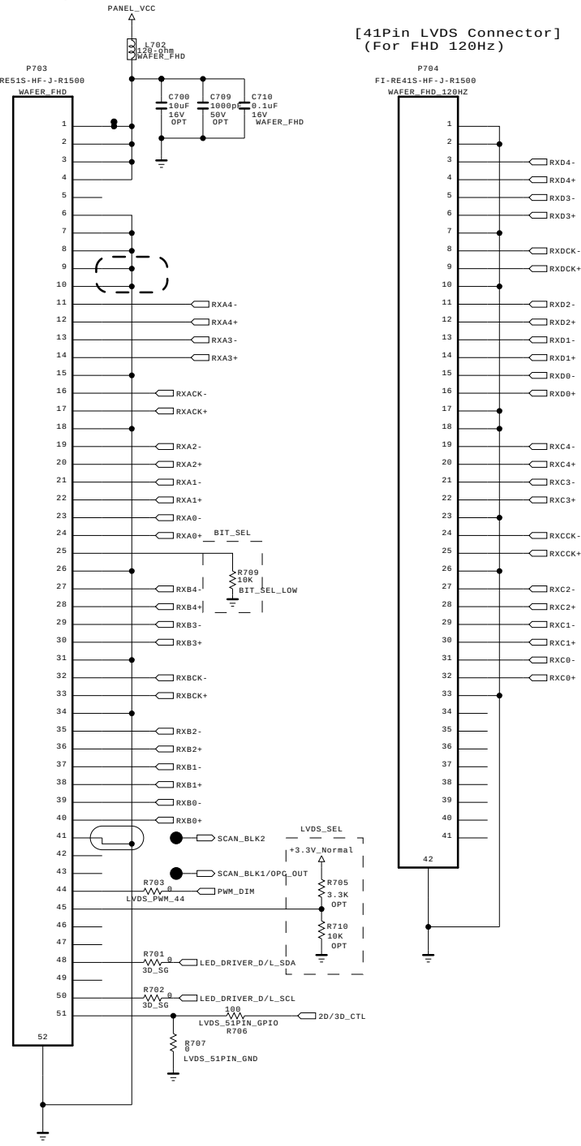
LG ELECTRONICS

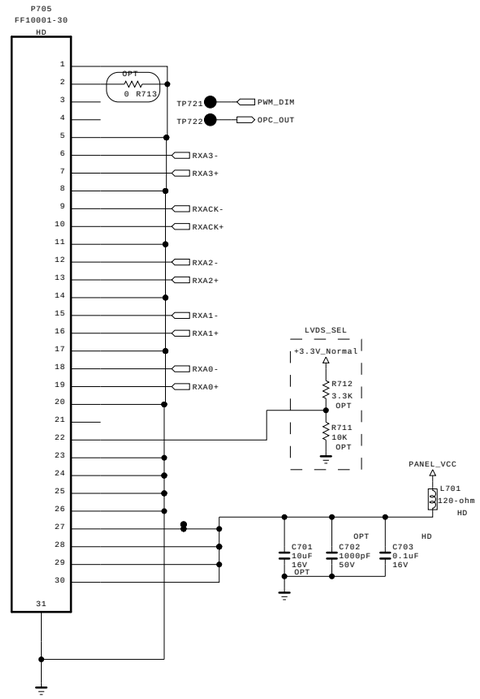
MODEL	GP2R	DATE	20101023
BLOCK	RS232C_9PIN	SHEET	10

[51Pin LVDS Connector]
(For FHD 60/120Hz)



[41Pin LVDS Connector]
(For FHD 120Hz)

[30Pin LVDS Connector]
(For HD 60Hz_Normal)



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SECRET
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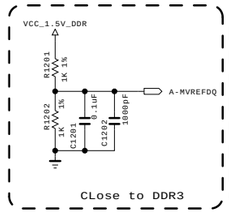
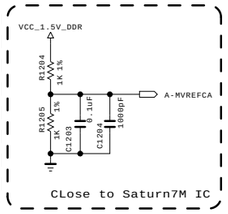
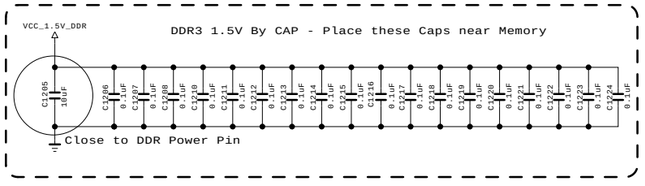
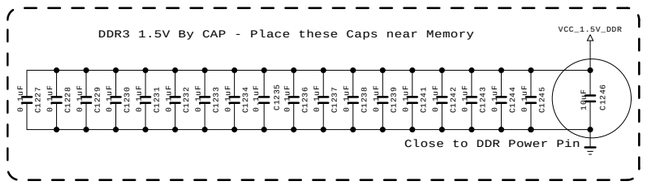
LG ELECTRONICS

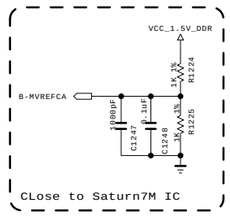
MODEL	GP2R	DATE	20101023
BLOCK	LVDS_LARGE	SHEET	11

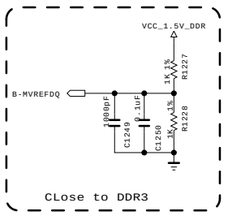


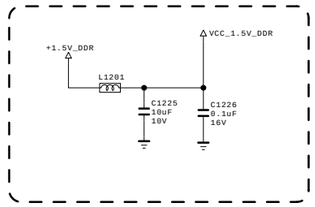




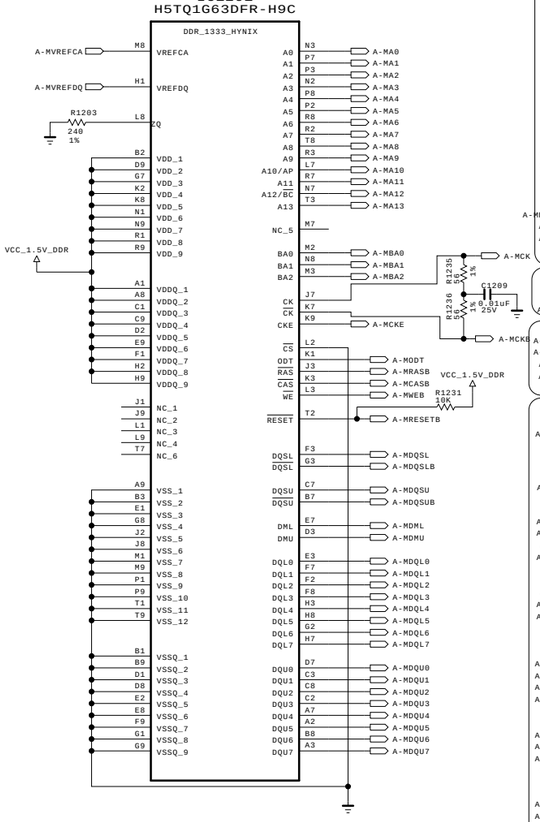


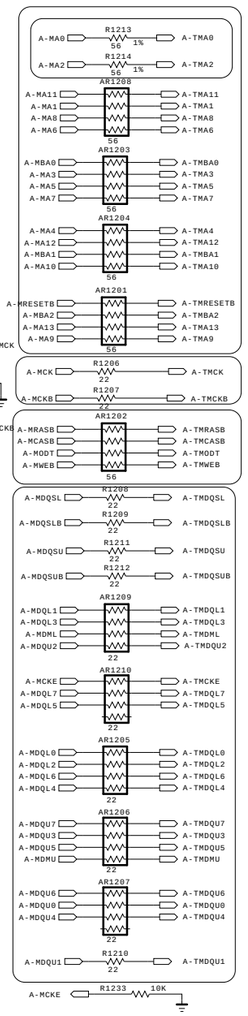




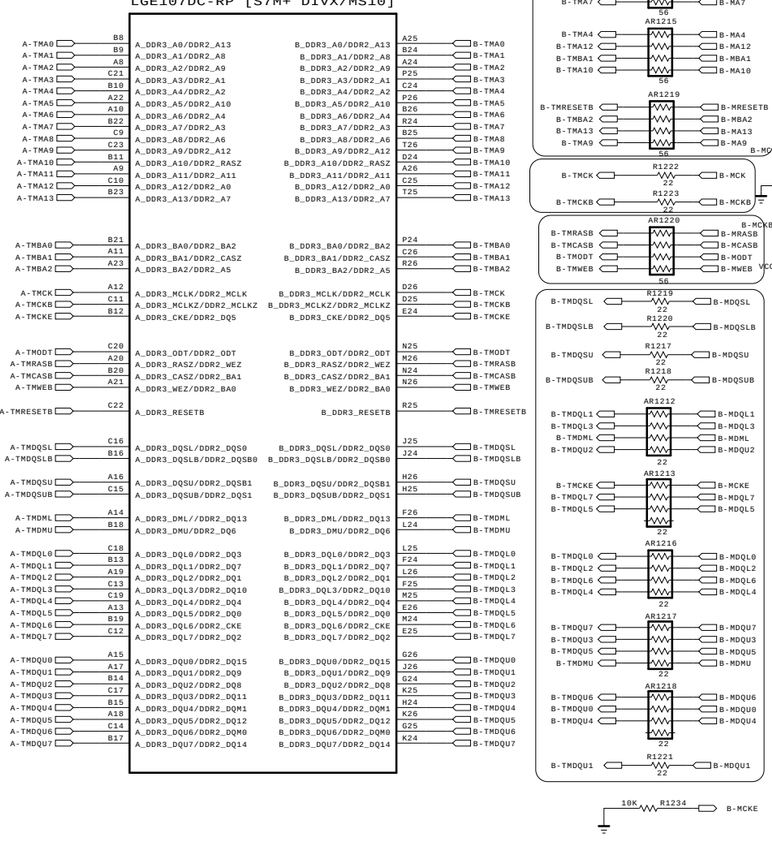


EAN61828901
IC1201
H5TQ1G63DFR-H9C





S7M-PLUS_DivX_MS10
IC101
LGE107DC-RP [S7M+ DIVX/MS10]



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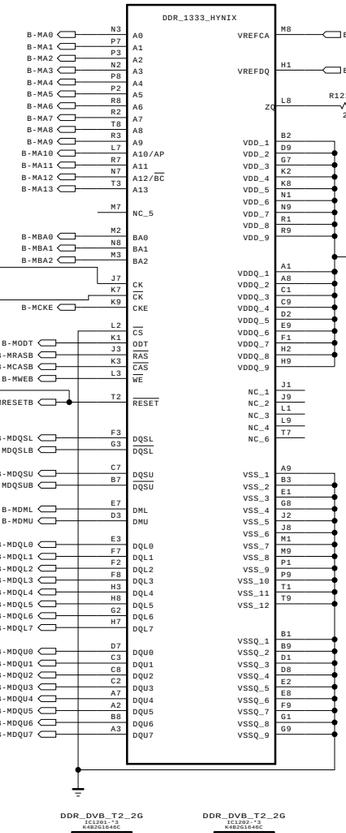

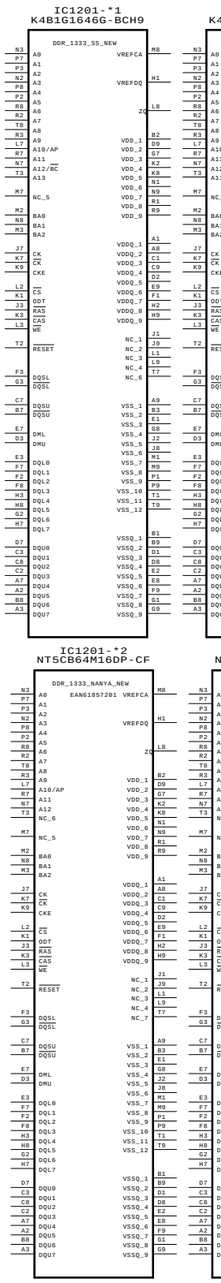

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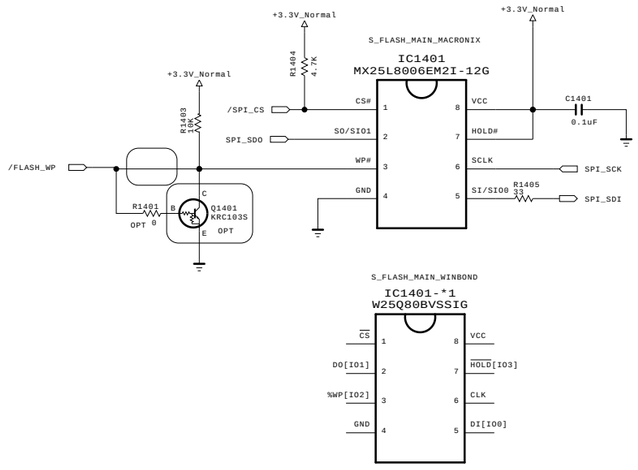
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	DDR_256	SHEET	12



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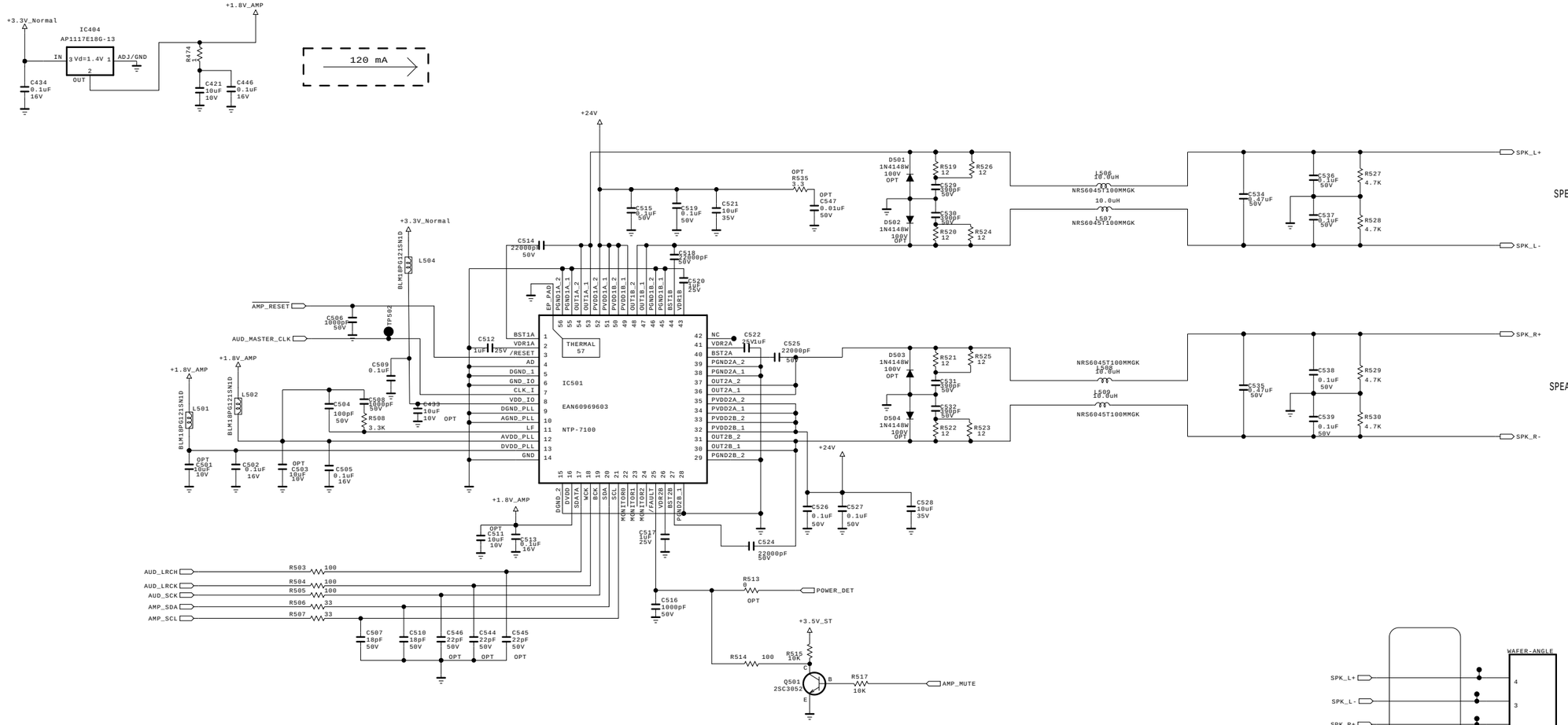
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	SFLASH_1MB	SHEET	13 /



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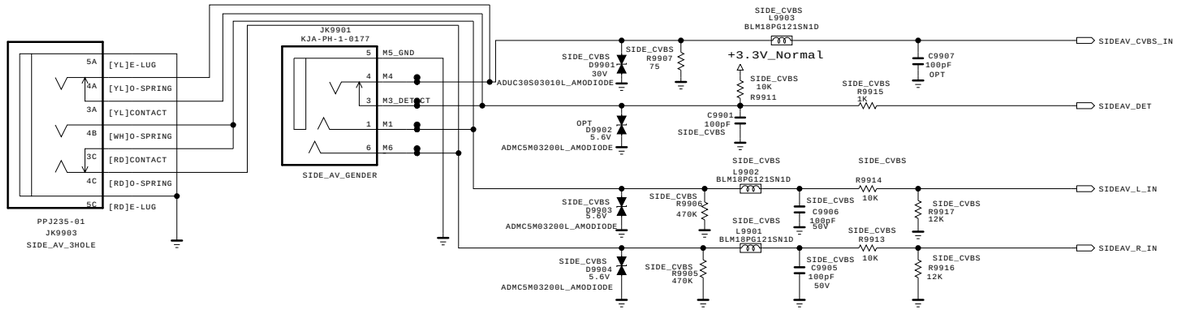
SECRET

LGElectronics

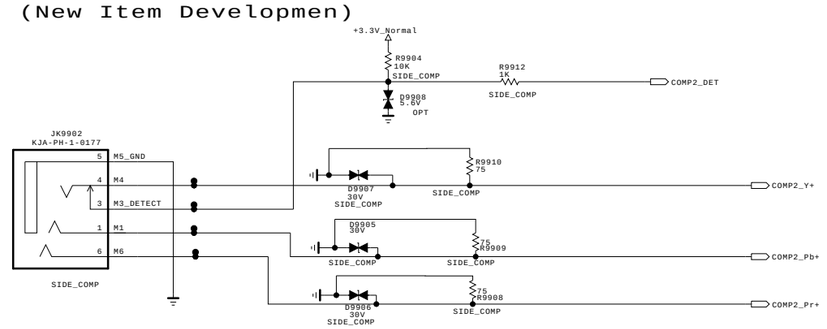
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	AMP_NTP	SHEET	16 /

SIDE CVBS PHONE JACK
(New Item Development)



SIDE COMPONENT PHONE JACK
(New Item Developmen)



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SECRET
LGElectronics

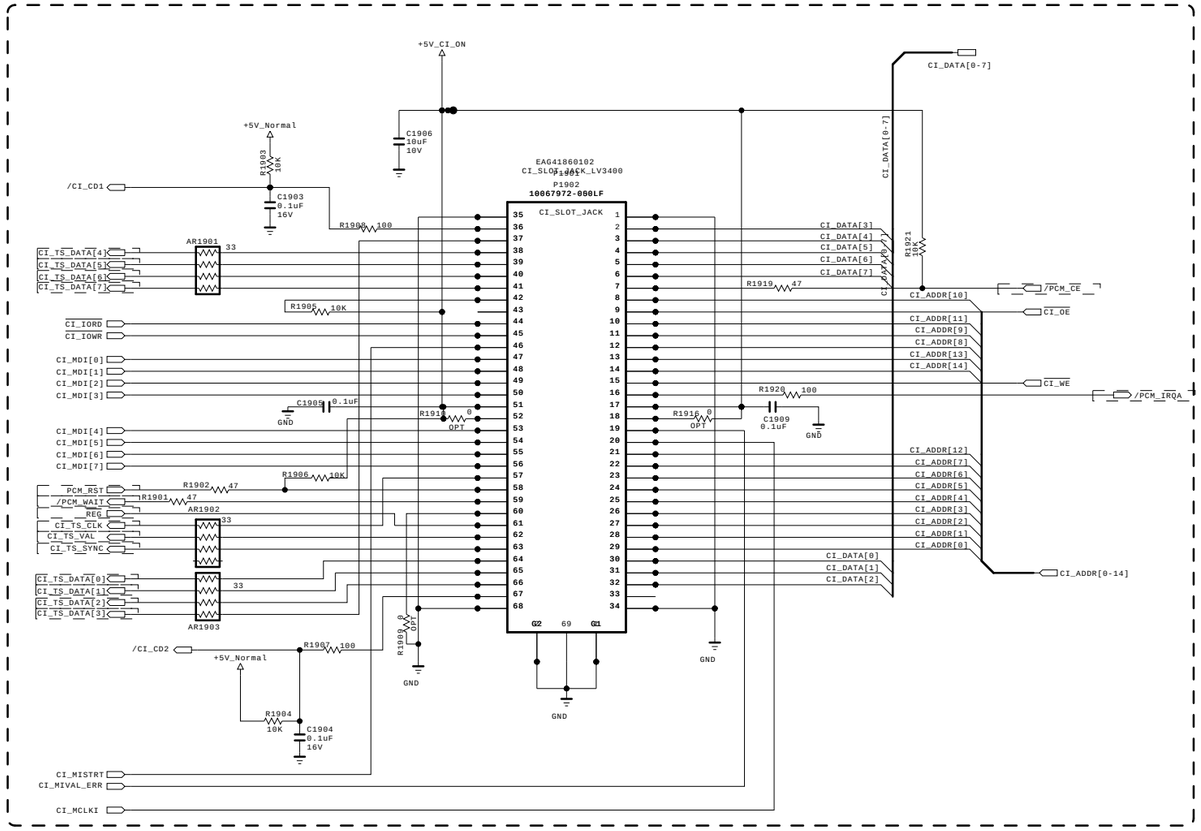
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	SIDE_JACK	SHEET	18 /

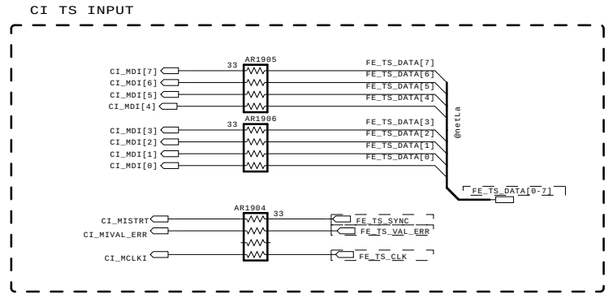
CI Region

* Option name of this page : CI_SLOT
(because of Hong Kong)

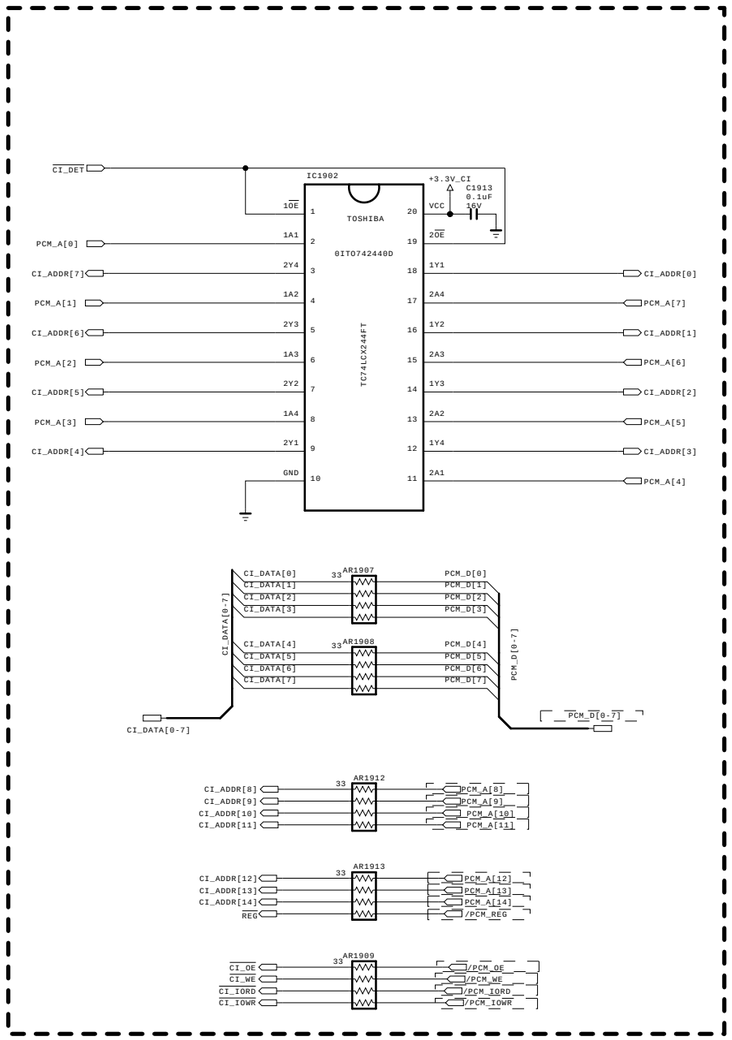
CI SLOT

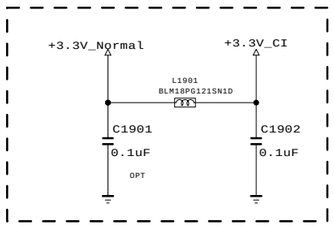


CI TS INPUT

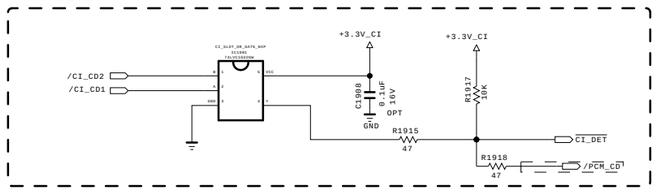


CI HOST I/F

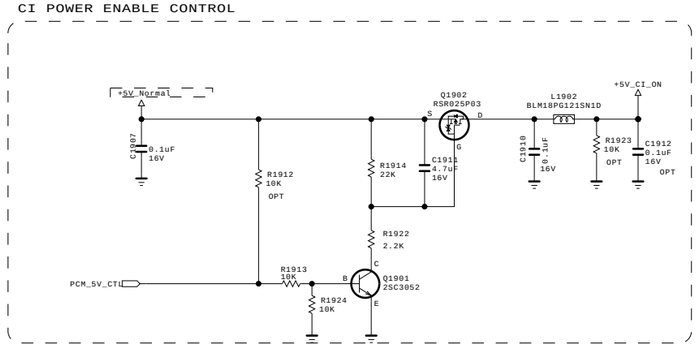




CI DETECT



CI POWER ENABLE CONTROL



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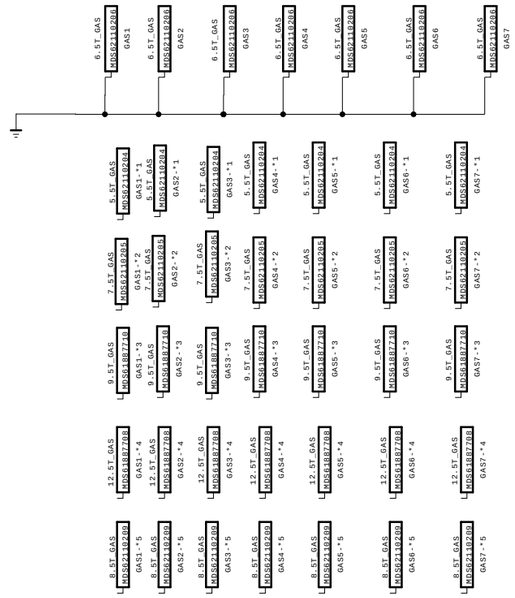
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	PCMCI	SHEET	20 /

LGE Internal Use Only

SMD GASKET



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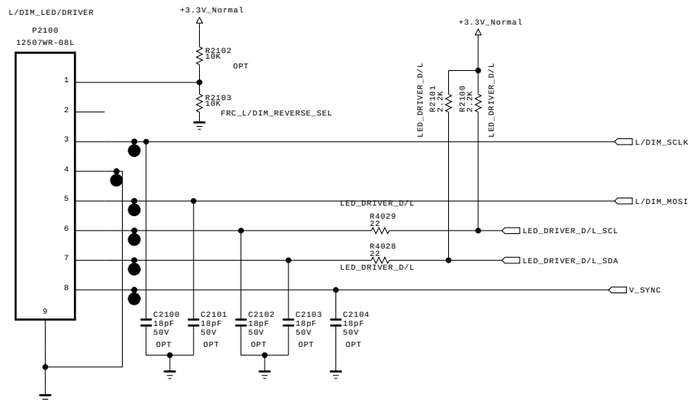
SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	SMD_GAS	SHEET	20 /



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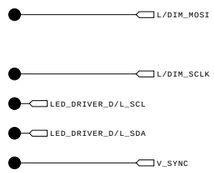
SECRET
LGElectronics

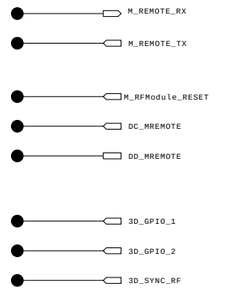
LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	L/DIM_LED	SHEET	21 /

NON_L/DIM_LED/DRIVER



NON_3D_SG



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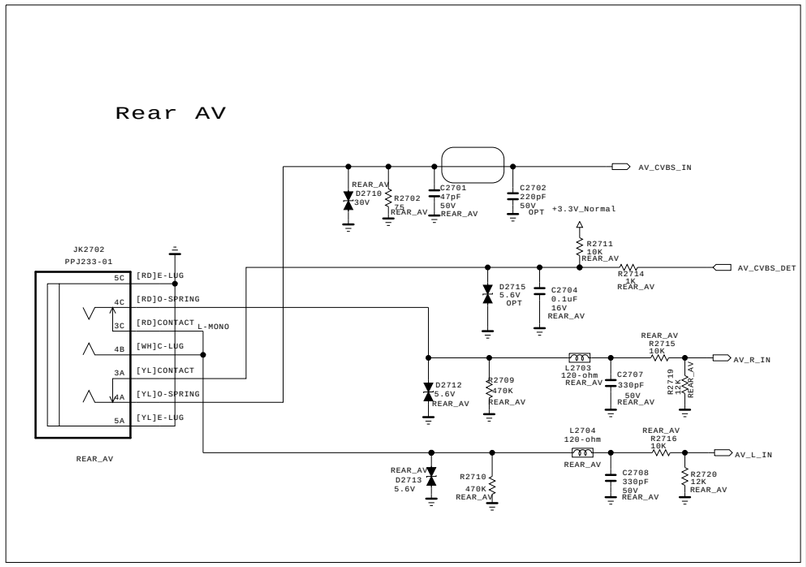
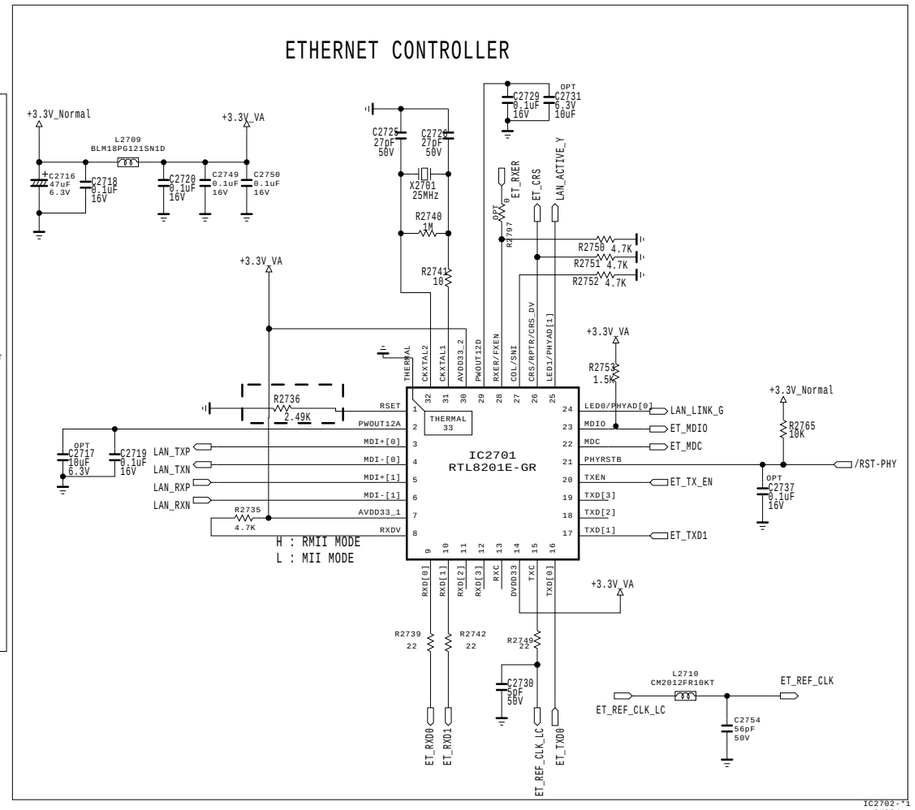
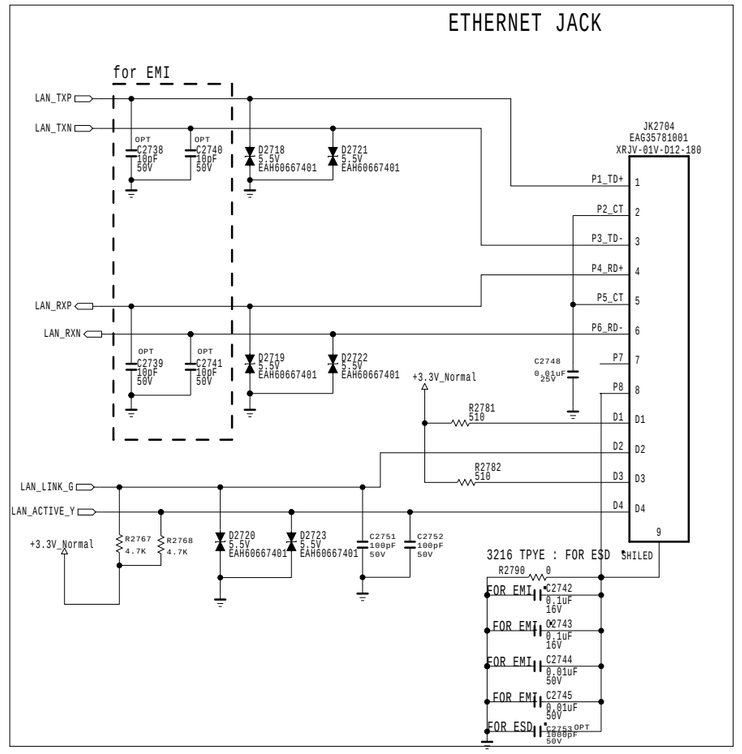
SECRET
LGElectronics

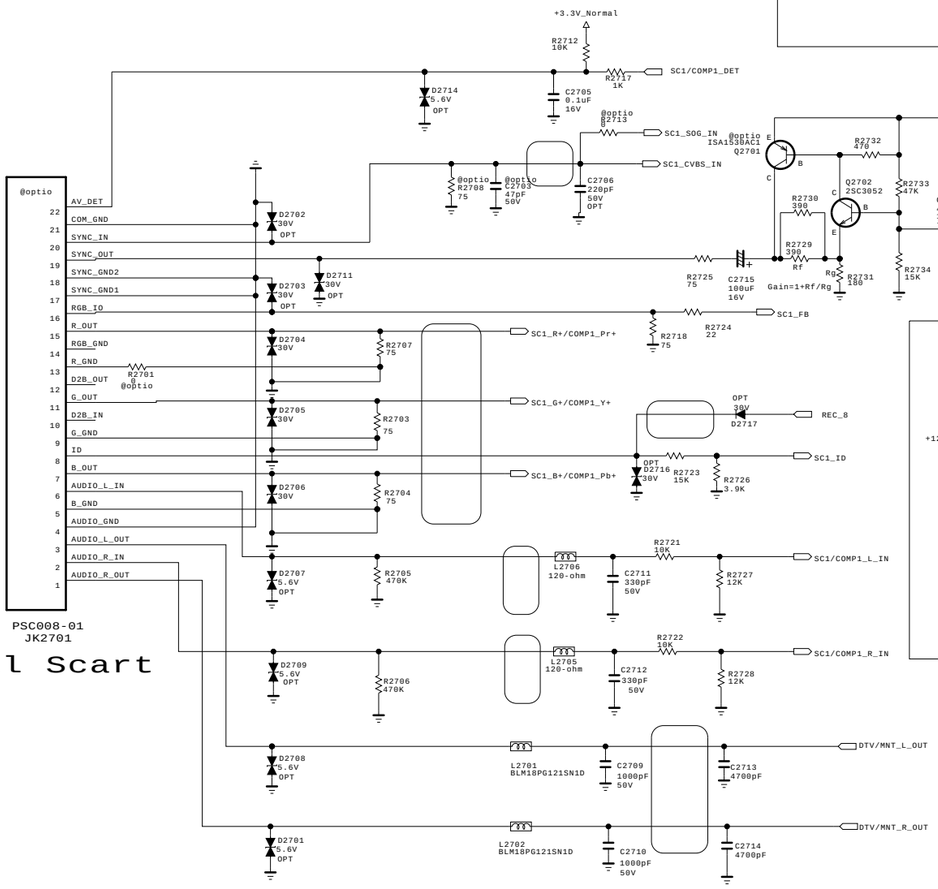
LG ELECTRONICS

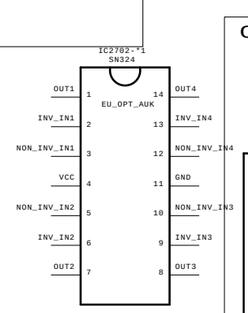
MODEL	GP2R	DATE	20101023
BLOCK	NON_L/DIM	SHEET	26 /

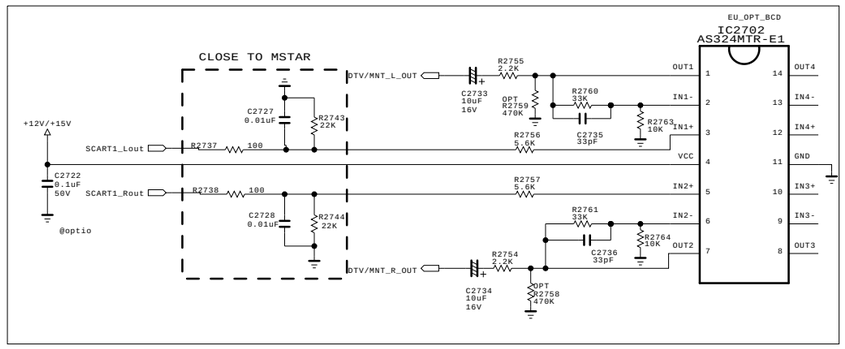


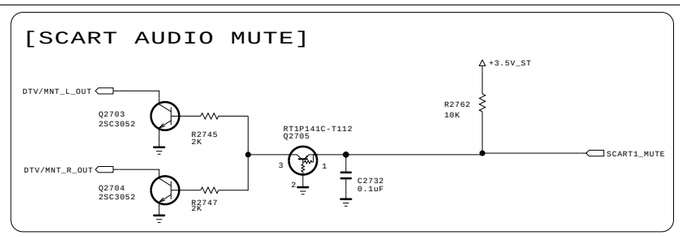


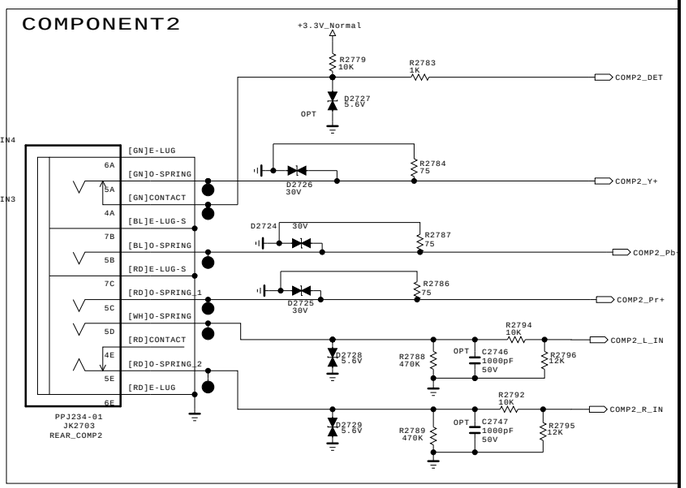


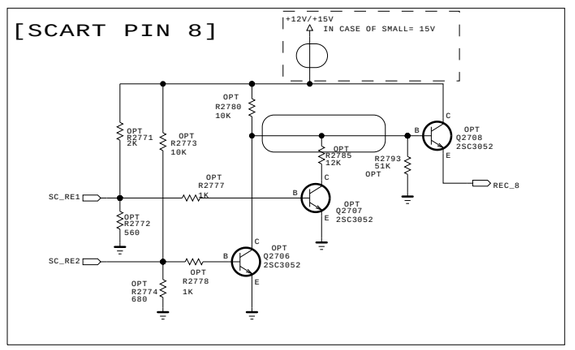












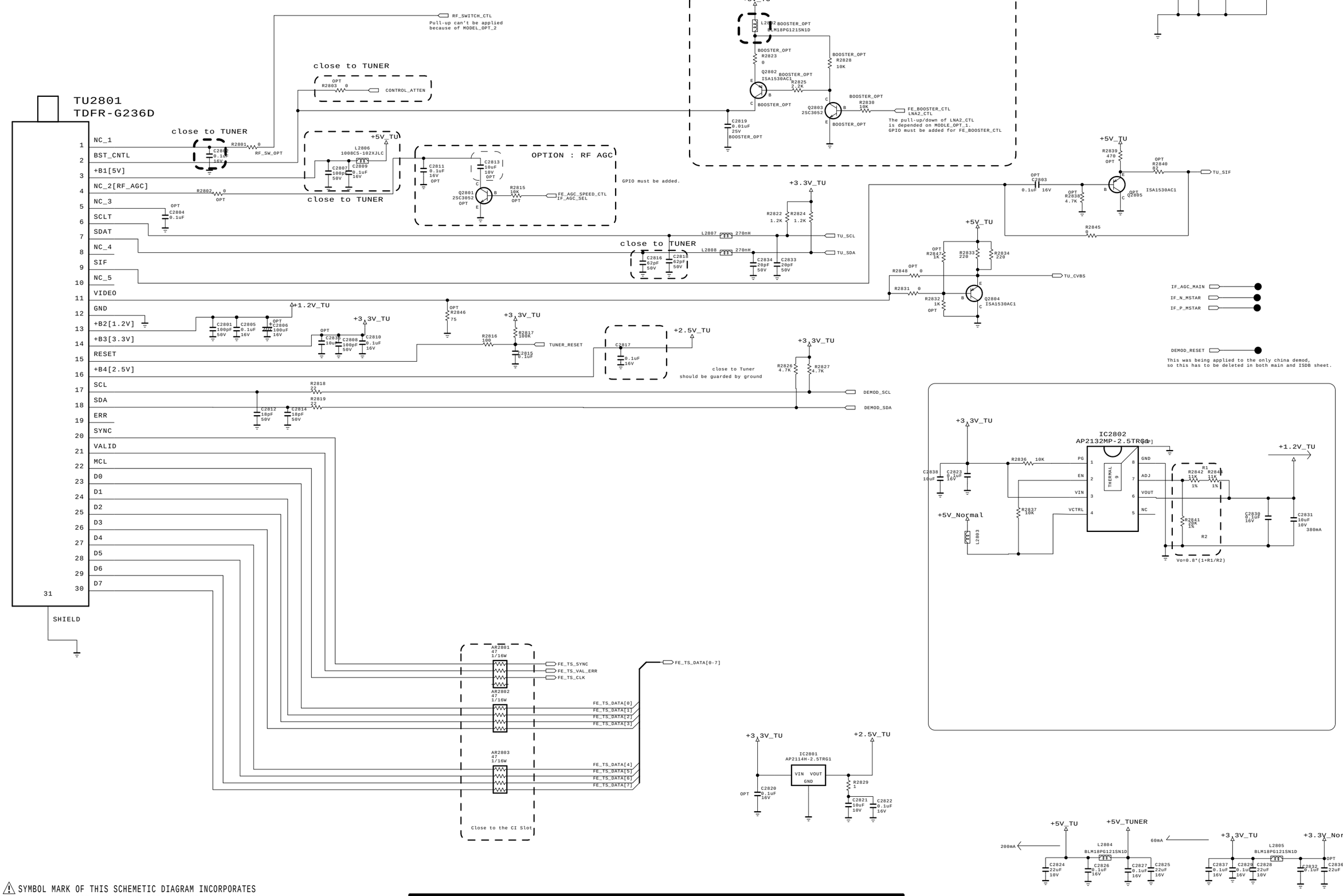
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	DVB_T2_LAN	SHEET	27

LGIT CAN EU T2



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	DVB_T2_TUNER	SHEET	28


LG Electronics Inc.

LCD TV Repair Guide
`11 years New Basic Models

Contents

LCD TV EU Group

LCD TV Research Department

Apr. 18th, 2011

LCD TV Repair Guide

`11 years New Models

< Applicable Basic Model >
xxLK530T / xxLK550T / xxLV355T

2011

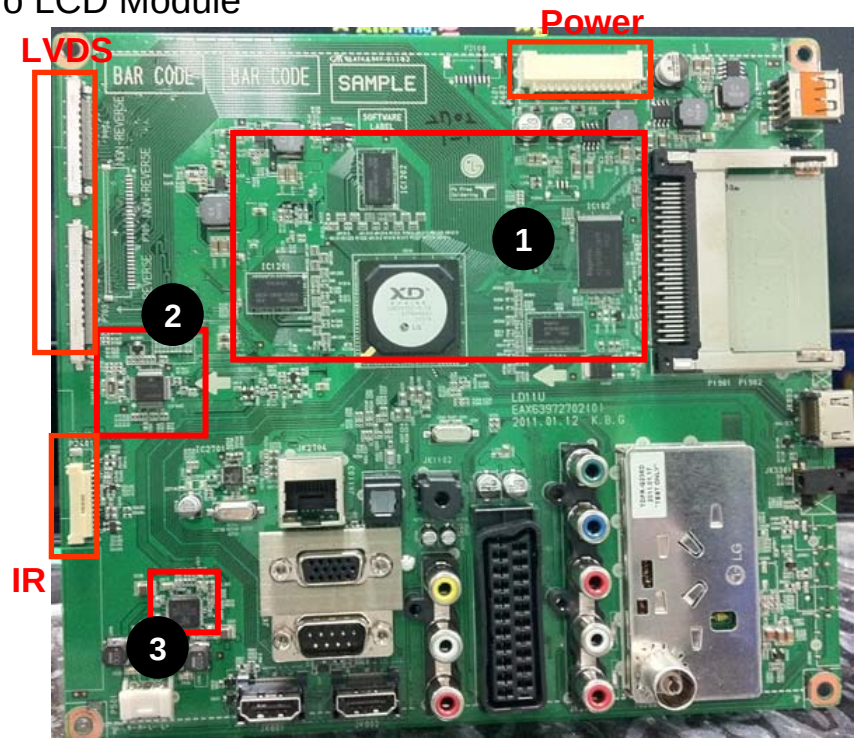
	Tool	Model
Lamp	LK53	32LK530T-ZC
		42LK530T-ZC
		47LK530T-ZC
	LK55	32LK550T-ZA
		42LK550T-ZA

	Tool	Model
Edge LED	LV35	32LV355T-ZC
		37LV355T-ZC
		42LV355T-ZC
		47LV355T-ZC

Main PCB

32/42/47LK530T (100HZ)

To LCD Module



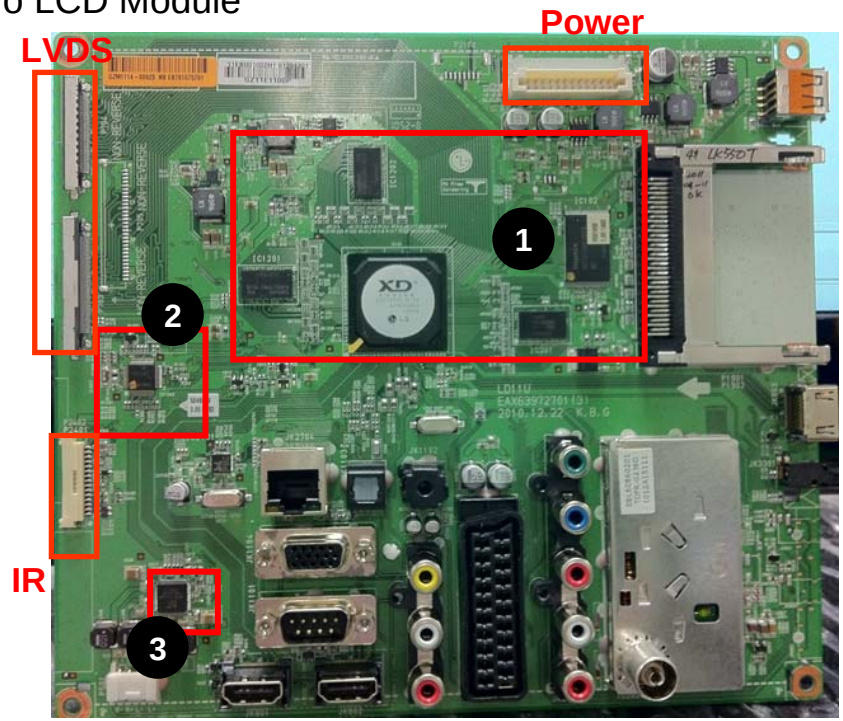
1. Main processor, DDR Memory Flash Memory
2. Micom for Key/IR sensing
3. Audio AMP (10W+10W)

*** 32/42/47LK530T_S7 Reused ('11)**
Main IC : LGE101_Mstar
Tuner Type : TDFR-G236D (DVB-T/C/T2/PAL/SECAM)
Display Type (Resolution) : LCD TV (1920 x 1080)
Interface : HDMI 3EA , Component 1EA, AV 1EA, USB 1EA

Main PCB

32/42LK550T (100HZ)

To LCD Module

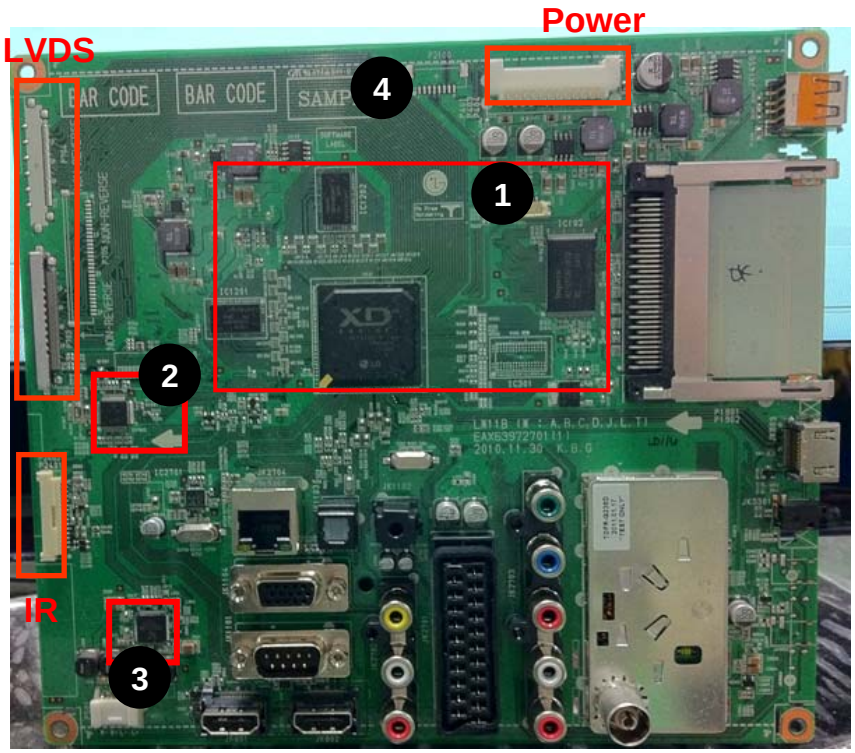


1. Main processor, DDR Memory Flash Memory
2. Micom for Key/IR sensing
3. Audio AMP (10W+10W)

*** 32/42LK550T_S7 Reused ('11)**
Main IC : LGE101_Mstar
Tuner Type : TDFR-G236D (DVB-T/C/T2/PAL/SECAM)
Display Type (Resolution) : LCD TV (1920 x 1080)
Interface : HDMI 3EA , Component 1EA, AV 1EA, USB 1EA

Main PCB

32/37/42/47LV355T (50HZ)

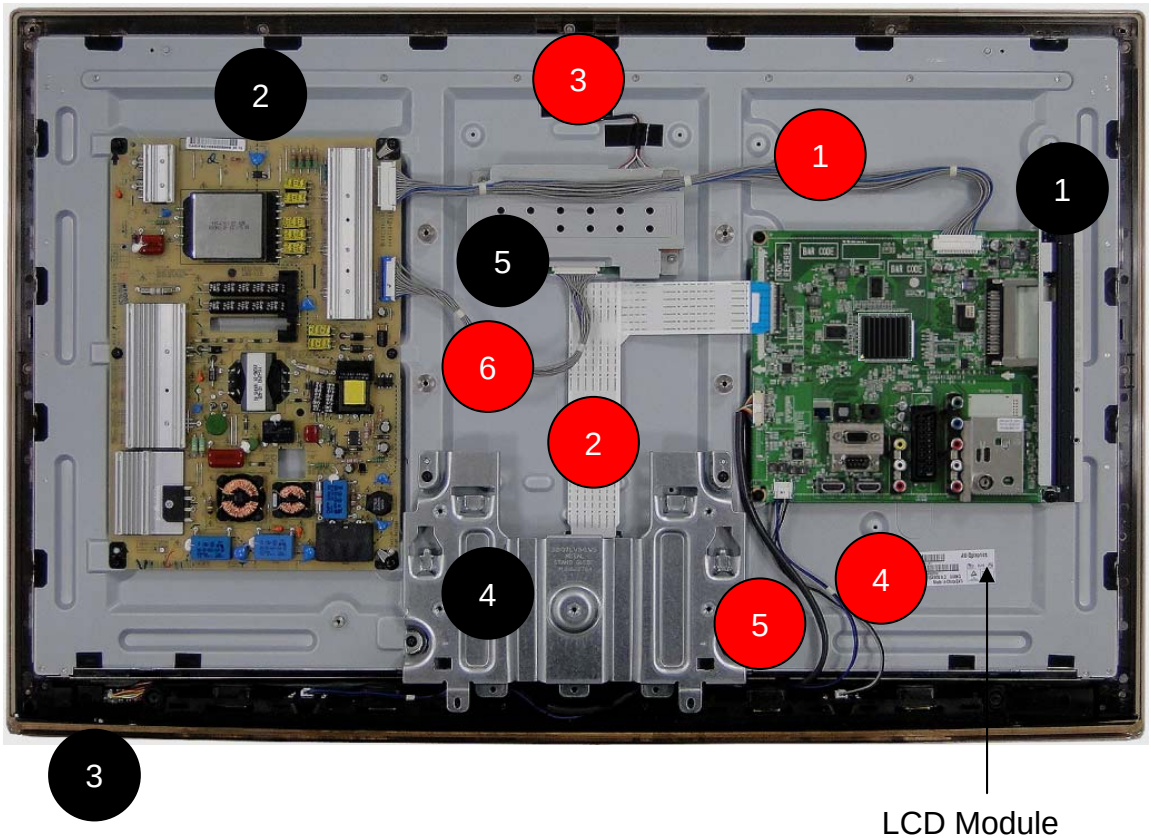


1. Main processor, DDR Memory Flash Memory
2. Micom for Key/IR sensing
3. Audio AMP (10W+10W)

*** 32/37/42/47LV355T_S7 Reused ('11)**
Main IC : LGE101_Mstar
Tuner Type : TDFR-G236D (DVB-T/C/T2/PAL/SECAM) Display Type
(Resolution) : LED TV (1920 x 1080)
Interface : HDMI 3EA , Component 1EA, AV 1EA, USB 1EA

Interconnection - 1

32LV355T



[PCBs]

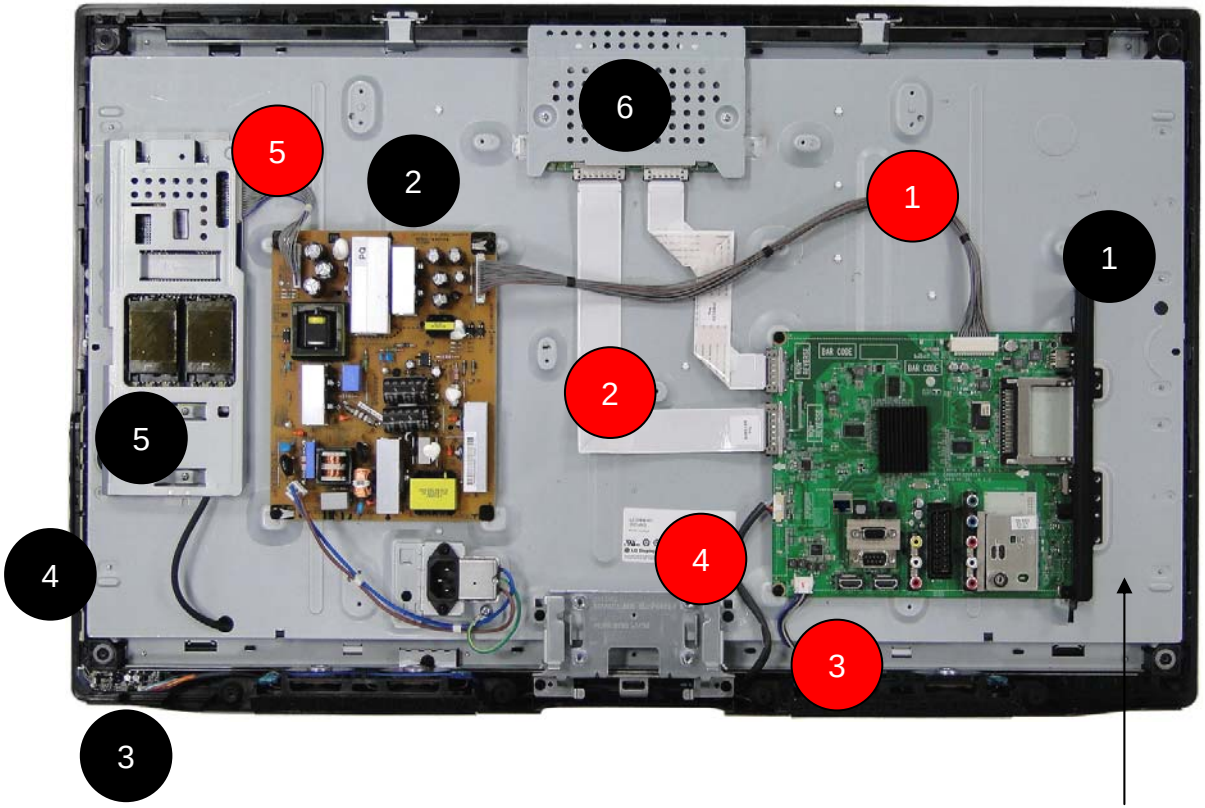
1. Main PCB
2. PSU
3. Soft Touch Key/IR PCB
4. Timing controller
5. LED Driver

[Cables]

1. Main / PSU cable
2. Main / Module LVDS cable
3. LED driver / Module cable
4. SPK cable
5. Soft Touch key/IR cable(15P)
6. LED driver / PSU cable 14P

Interconnection - 2

32LK530T



[PCBs]

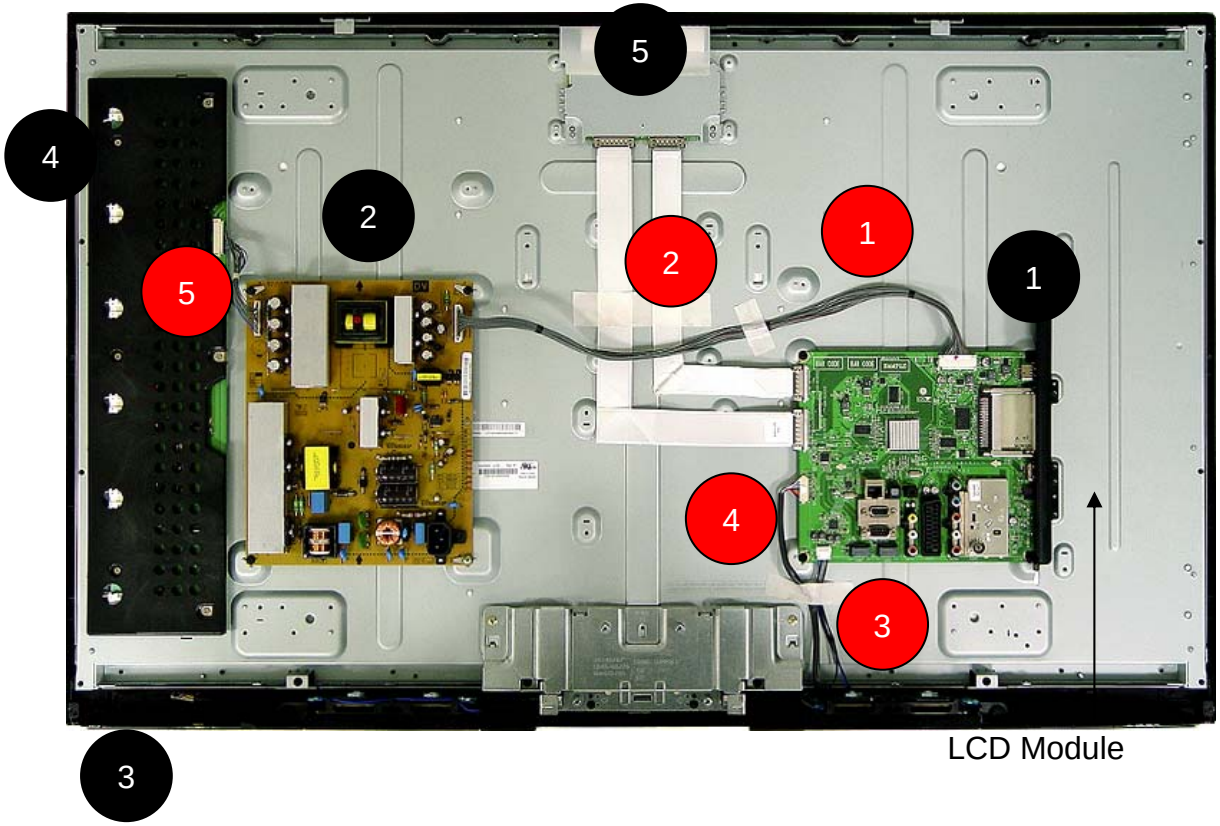
1. Main PCB
2. PSU (without inverter)
3. IR & Indicator PCB
4. Local Key PCB
5. Inverter
6. Timing controller

[Cables]

1. Main / PSU cable
2. Main / Module LVDS cable
3. SPK cable
4. IR/Local key cable(12P)
5. Inverter/PSU cable (14pin)

Interconnection - 3

42LK550T



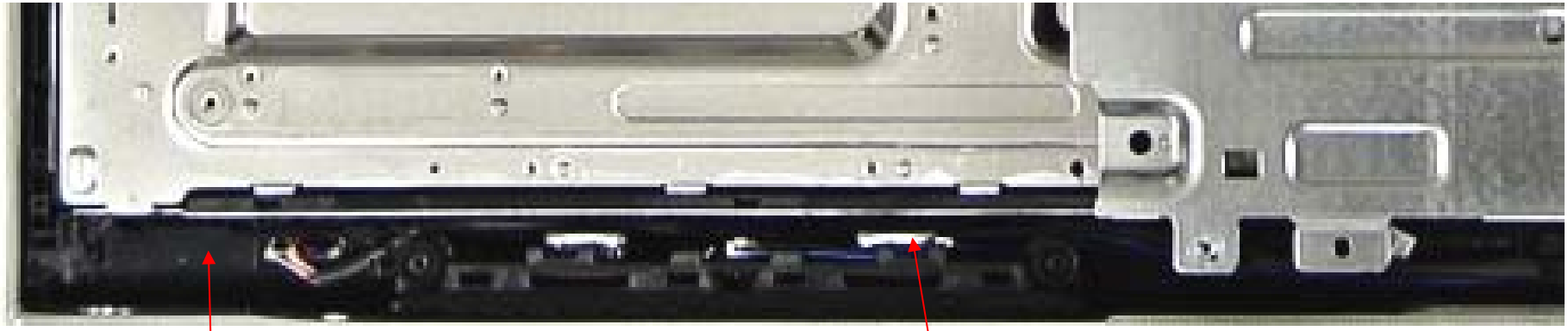
[PCBs]

1. Main PCB
2. PSU (without inverter)
3. Soft Touch Key/IR PCB
4. Inverter
5. Timing controller

[Cables]

1. Main / PSU cable
2. Main / Module LVDS cable
3. SPK cable
4. Soft Touch key/IR cable (15P)
5. Inverter/PSU cable (14pin)

Interconnection – sub PCB(LV355T/LK550T Series)



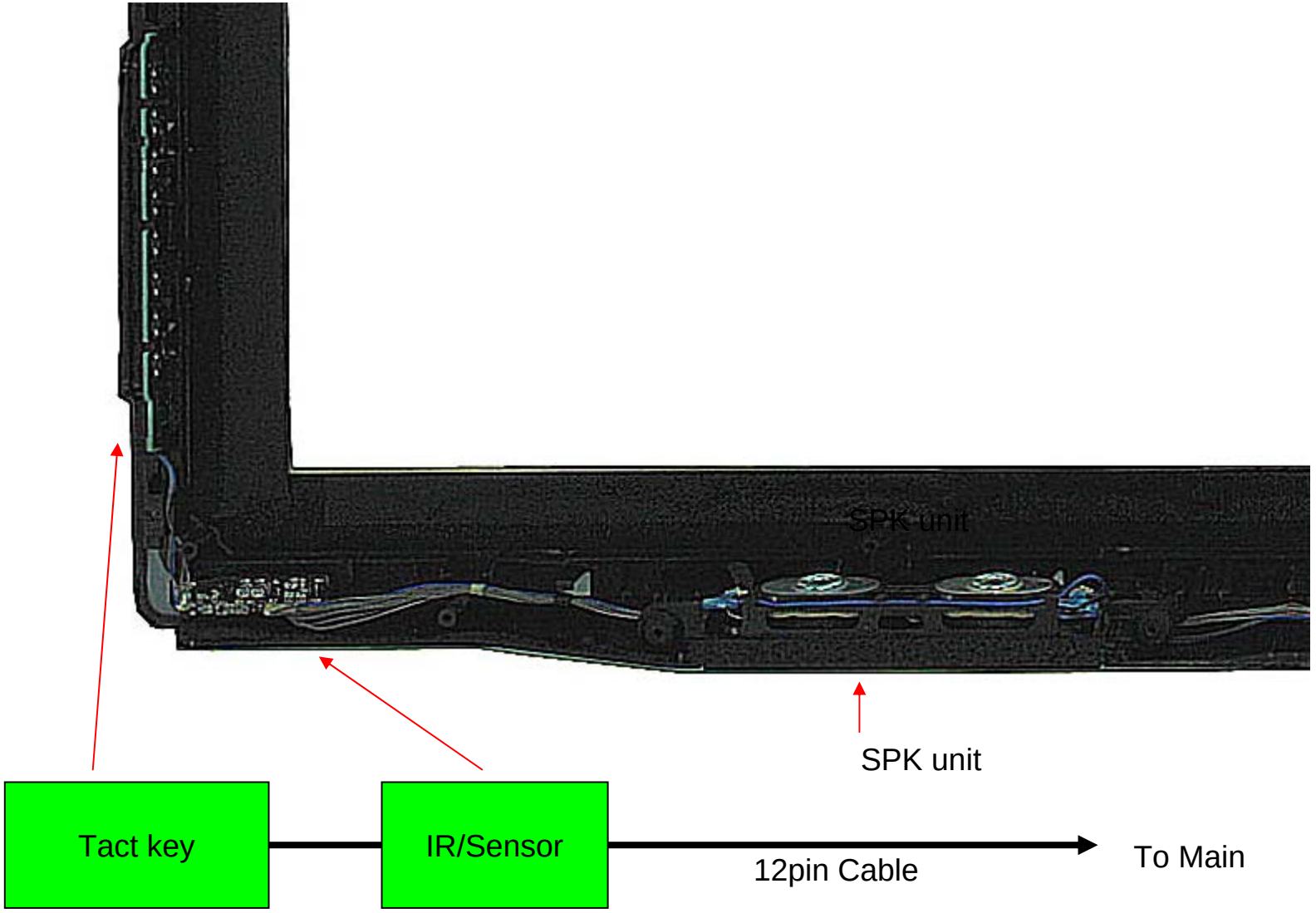
SPK unit

Soft Touch Key/IR PCB

15pin Cable

To Main

Interconnection – sub PCB(LK530T Series)

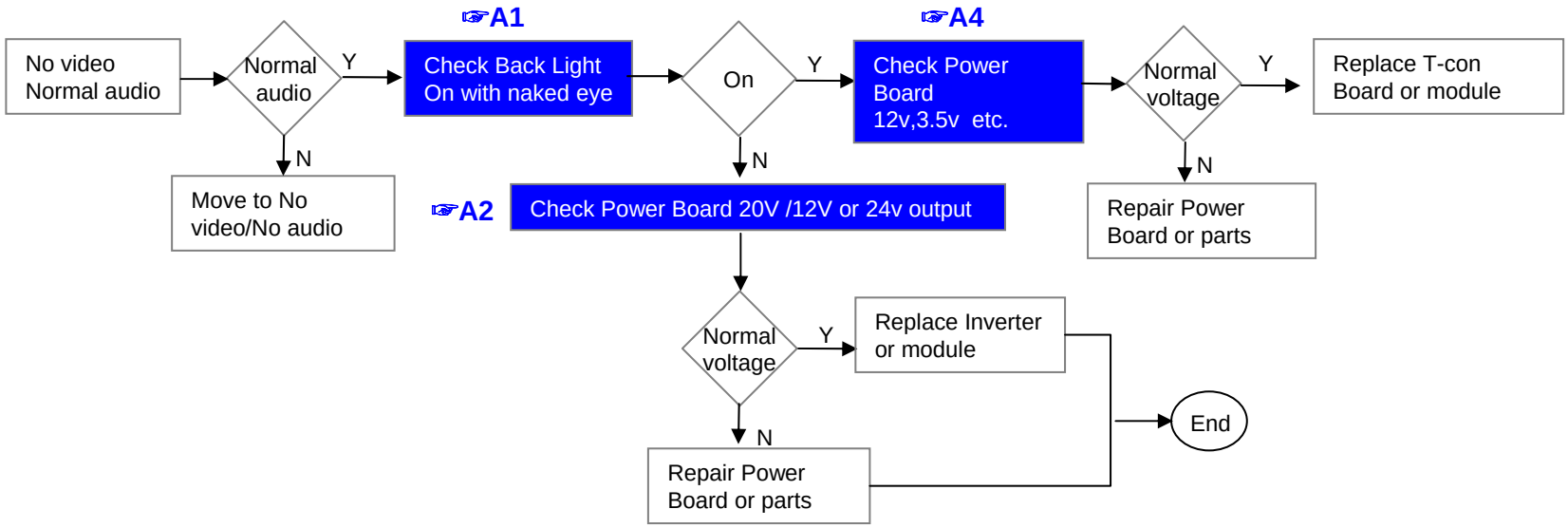


Contents of LCD TV Standard Repair Process

First of all, Check whether there is SVC Bulletin in GCSC System for these model.

LCD TV	Error symptom	A. Video error	Established date	2010. 2 .19	
		No video/ Normal audio	Revised date		1/13

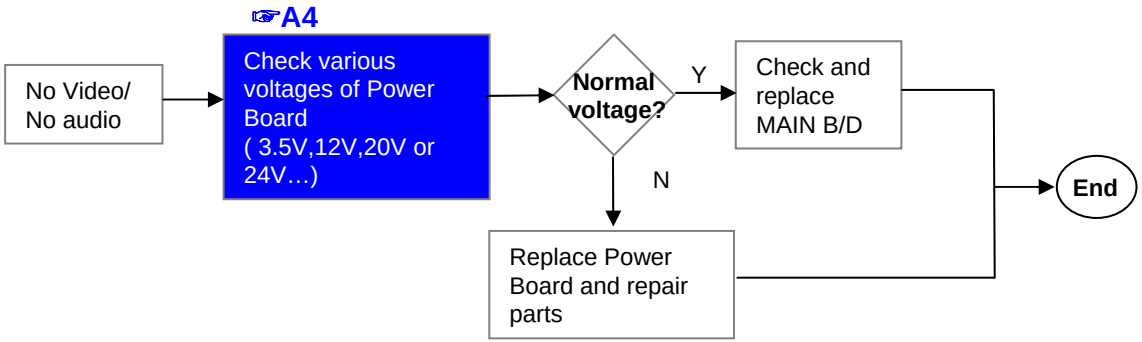
First of all, Check whether all of cables between board is inserted properly or not.
(Main B/D↔ Power B/D, LVDS Cable,Speaker Cable,IR B/D Cable,,,)



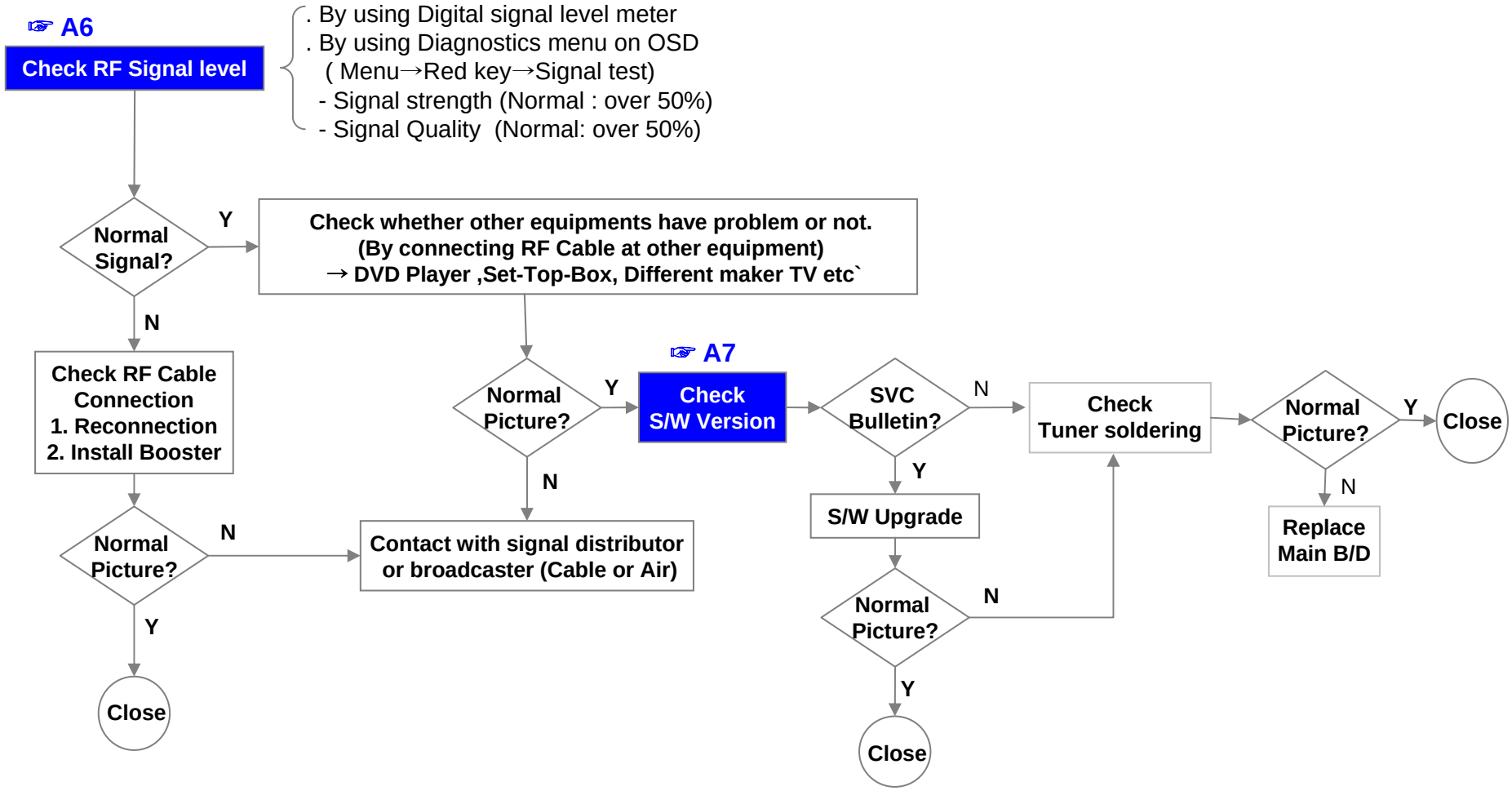
※Precaution ☞A7 & A3

Always check & record S/W Version and White Balance value before replacing the Main Board → Replace Main Board → Re-enter White Balance value

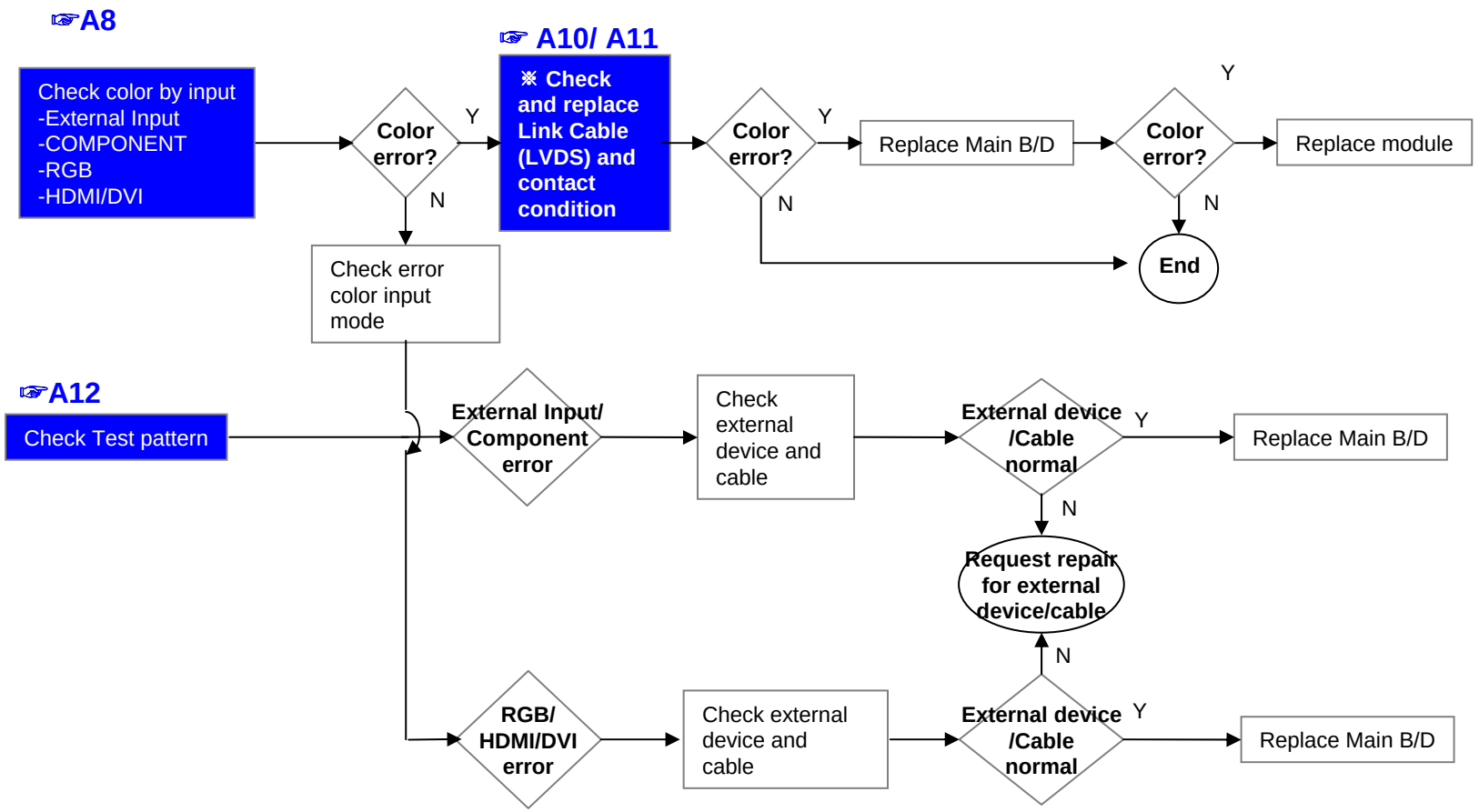
LCD TV	Error symptom	A. Video error	Established date	2010. 2 .19	
		No video/ No audio	Revised date		2/13



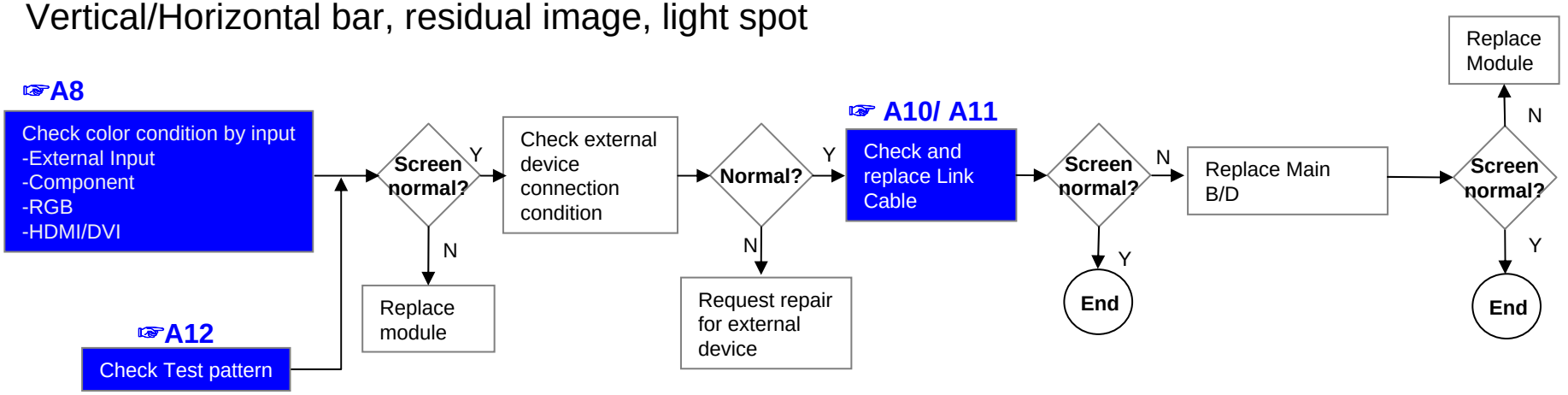
LCD TV	Error symptom	A. Picture Problem	Established date	2010. 2 .19	
		Picture broken/ Freezing	Revised date		3/13



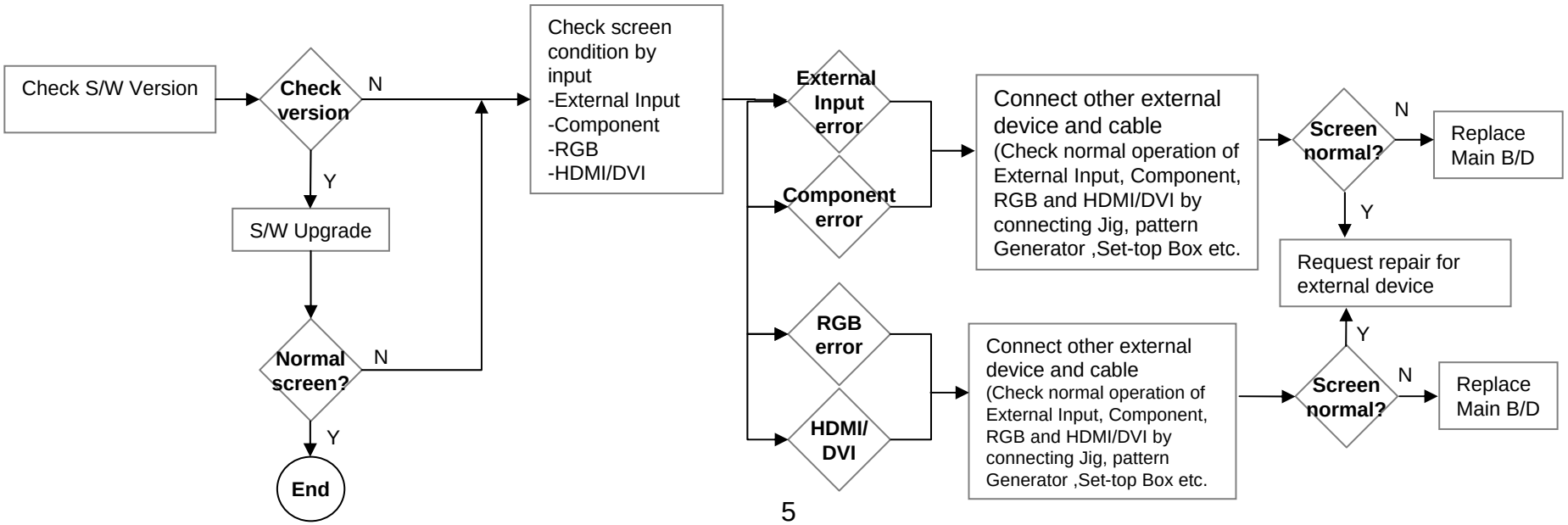
LCD TV	Error symptom	A. Video error	Established date	2010. 2 .19	
		Color error	Revised date		4/13



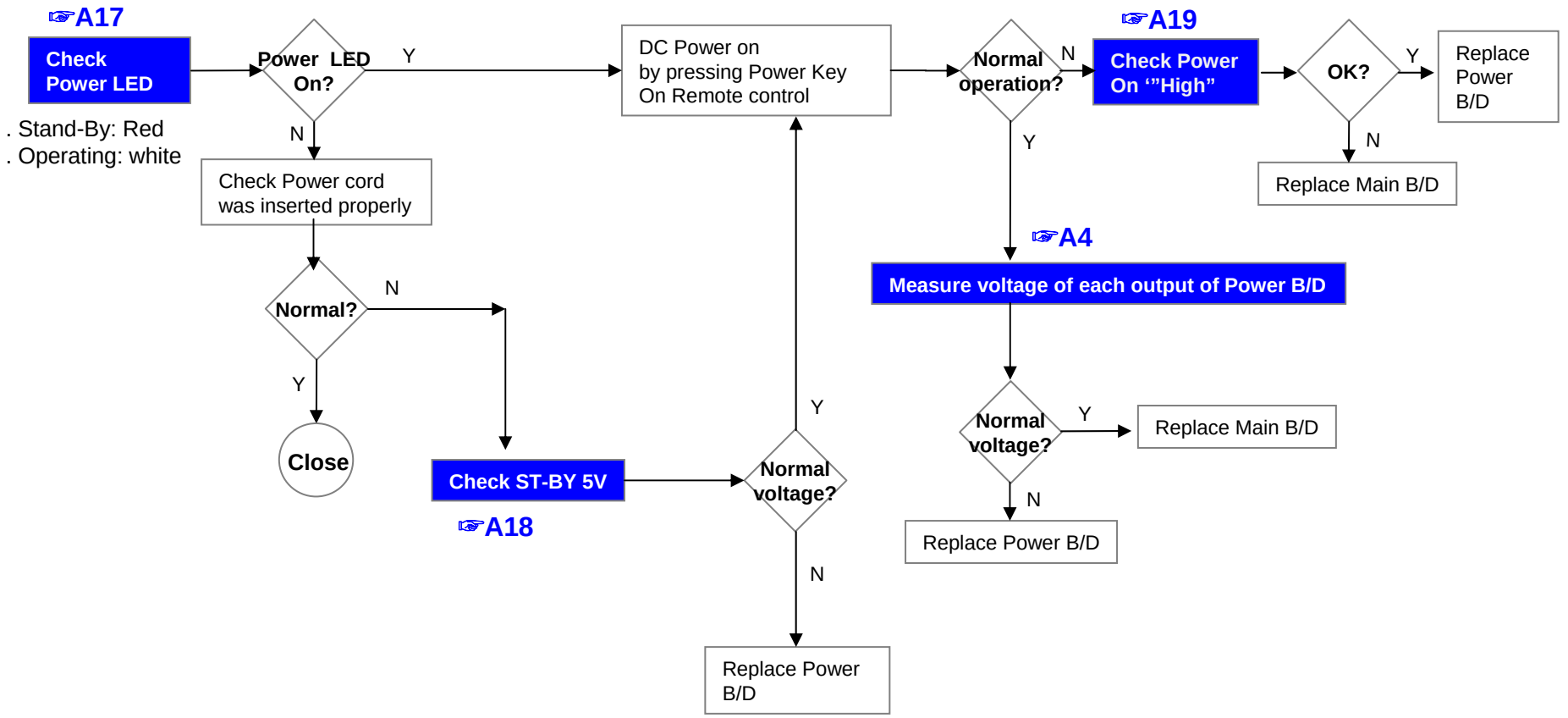
Vertical/Horizontal bar, residual image, light spot



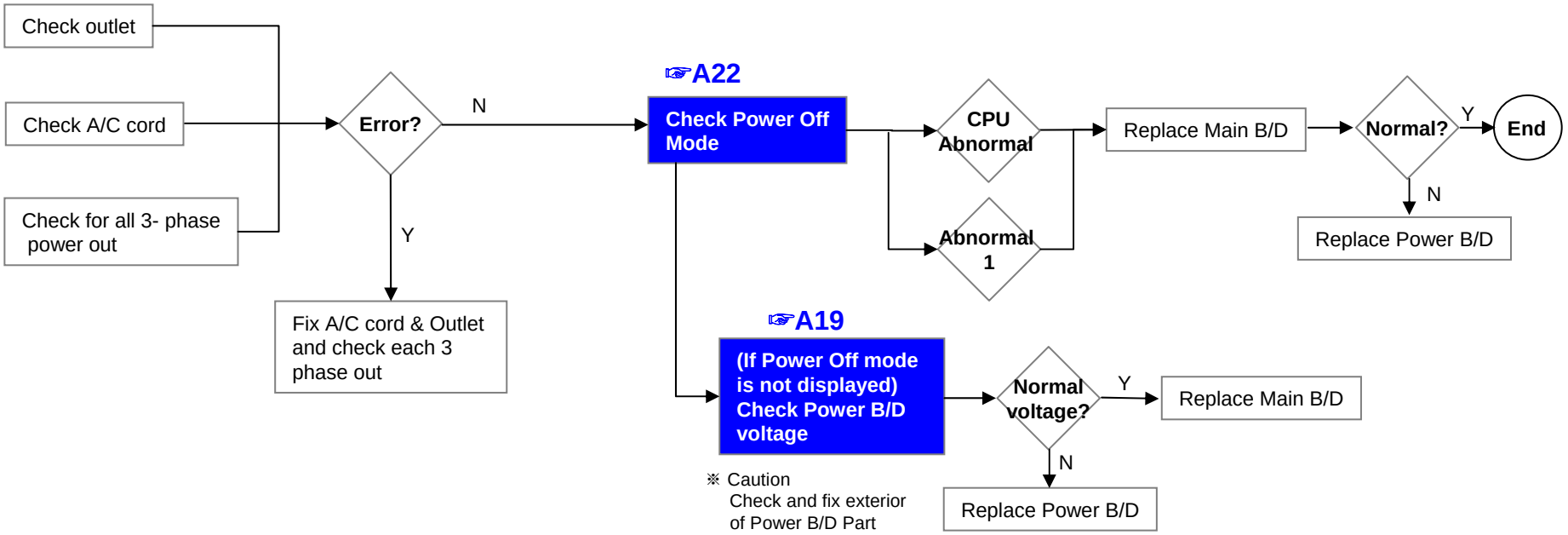
External device screen error-Color error



LCD TV	Error symptom	B. Power error	Established date	2010. 2 .19	
		No power	Revised date		6/13



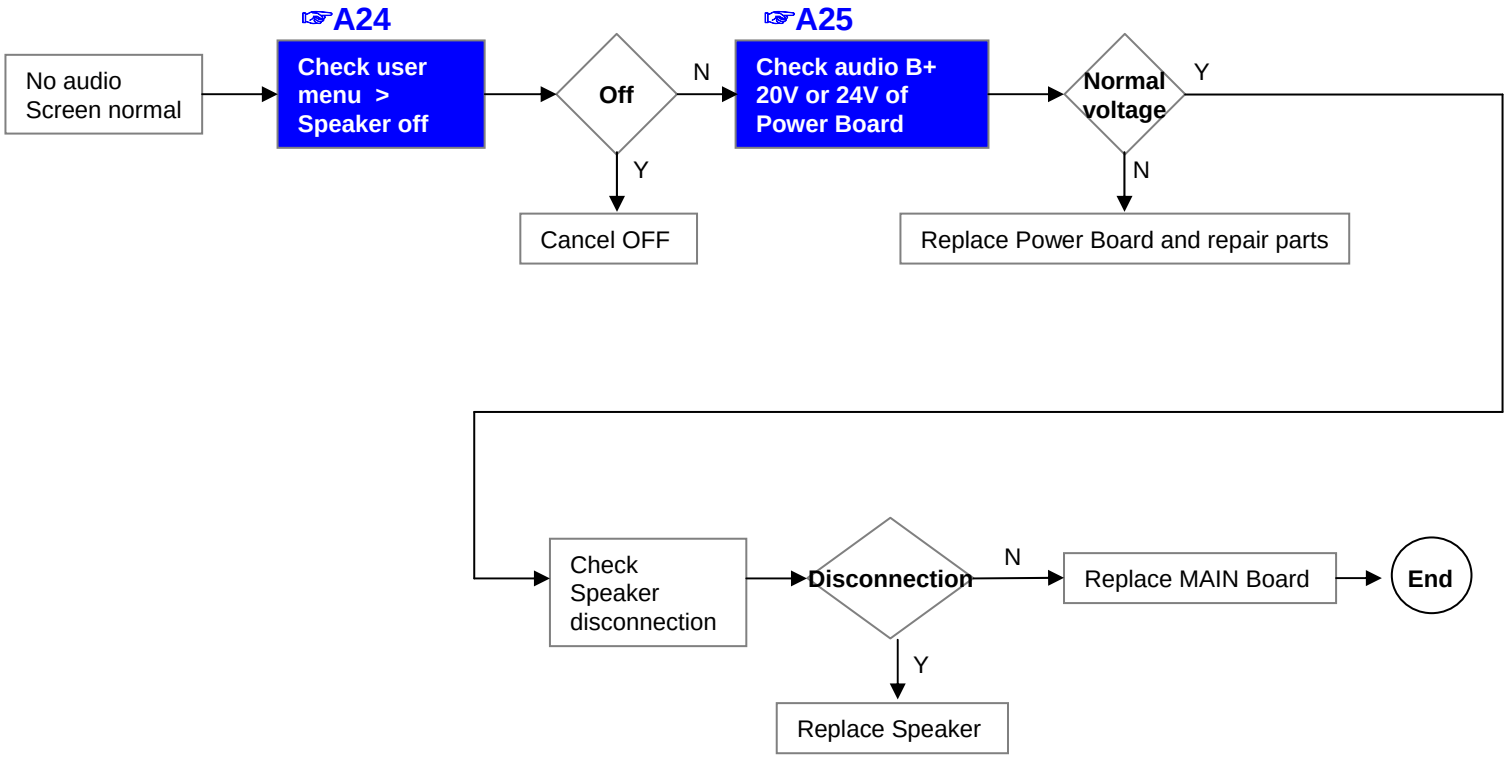
LCD TV	Error symptom	B. Power error	Established date	2010. 2 .19	
		Off when on, off while viewing, power auto on/off	Revised date		7/13



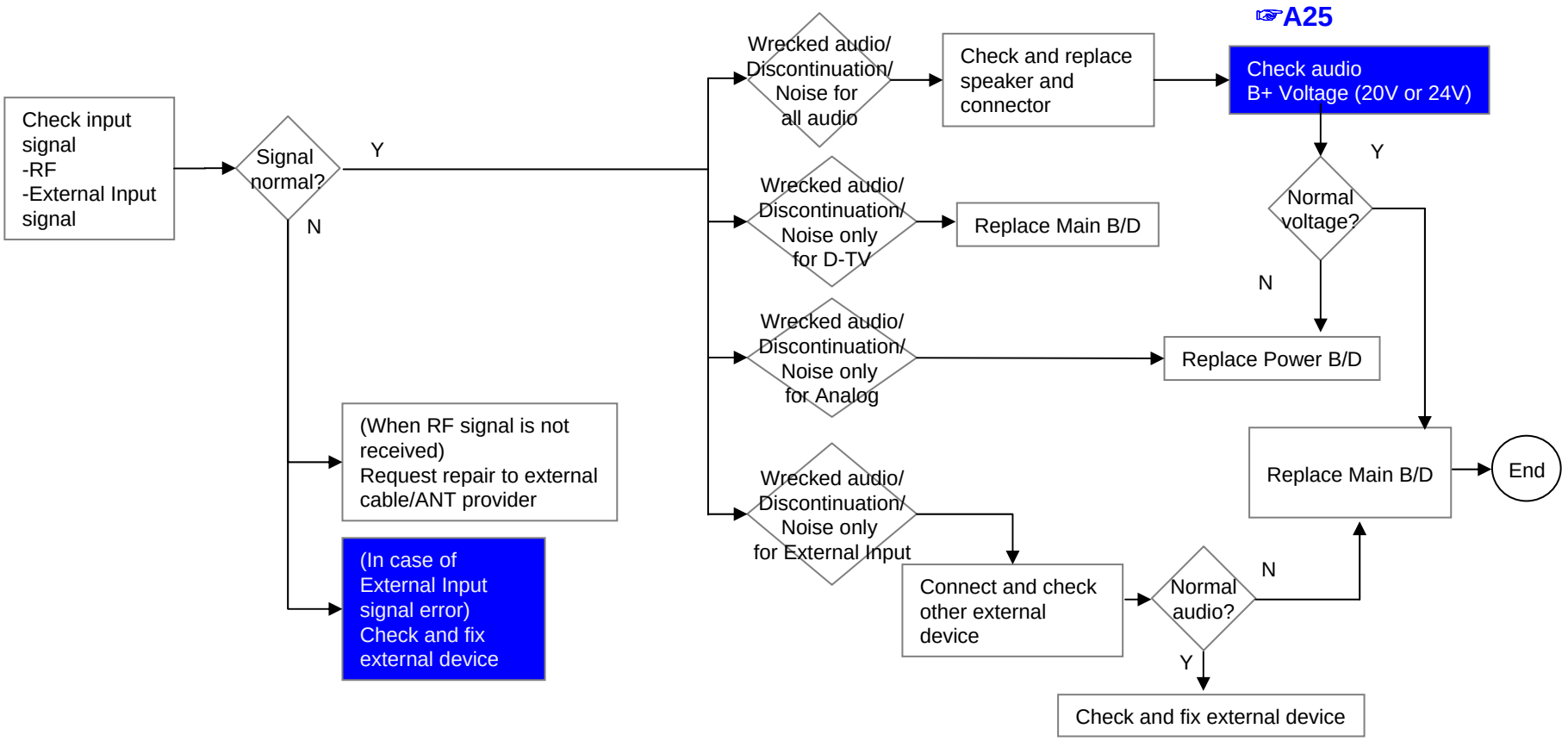
*** Please refer to the all cases which can be displayed on power off mode.**

Status	Power off List	Explanation
Normal	"POWEROFF_REMOTEKEY"	Power off by REMOTE CONTROL
	"POWEROFF_OFFTIMER"	Power off by OFF TIMER
	"POWEROFF_SLEEPTIMER"	Power off by SLEEP TIMER
	"POWEROFF_INSTOP"	Power off by INSTOP KEY
	"POWEROFF_AUTOOFF"	Power off by AUTO OFF
	"POWEROFF_ONTIMER"	Power off by ON TIMER
	"POWEROFF_RS232C"	Power off by RS232C
	"POWEROFF_RESREC"	Power off by Reservated Record
	"POWEROFF_RECEND"	Power off by End of Recording
	"POWEROFF_SWDOWN"	Power off by S/W Download
	"POWEROFF_UNKNOWN"	Power off by unknown status except listed case
Abnormal	"POWEROFF_ABNORMAL1"	Power off by abnormal status except CPU trouble
	"POWEROFF_CPUABNORMAL"	Power off by CPU Abnormal

LCD TV	Error symptom	C. Audio error	Established date	2010. 2 .19	
		No audio/ Normal video	Revised date		8/13

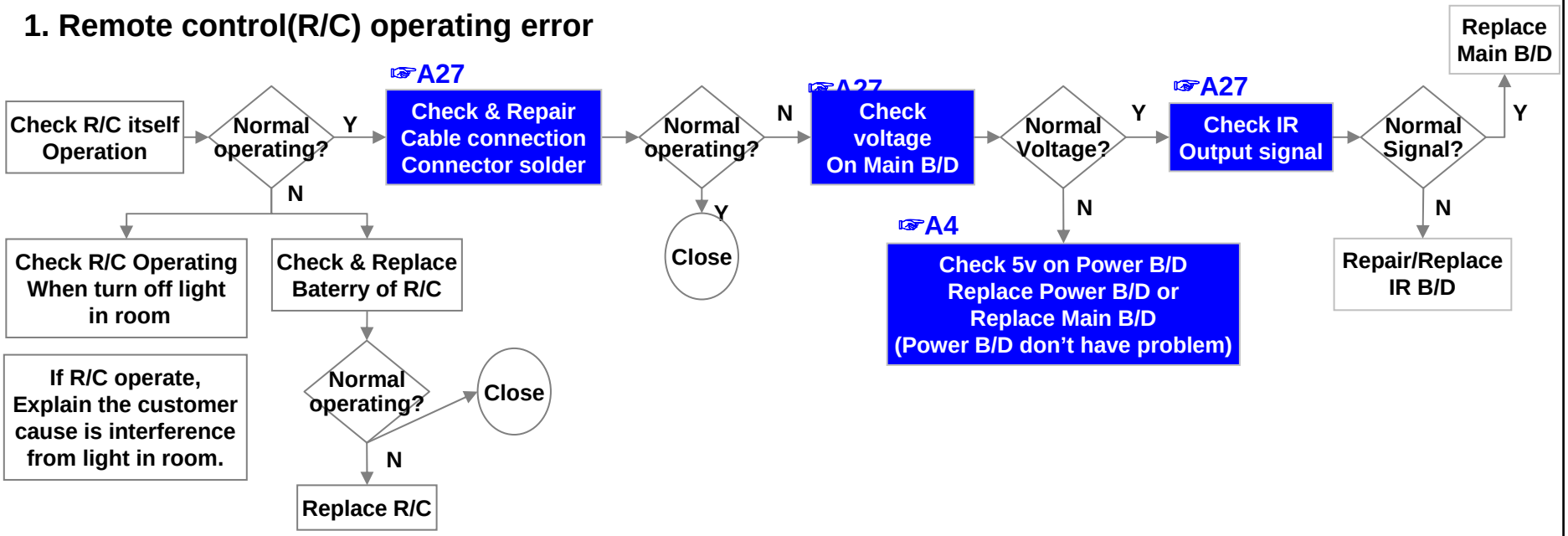


→ abnormal audio/discontinuation/noise is same after “Check input signal” compared to No audio

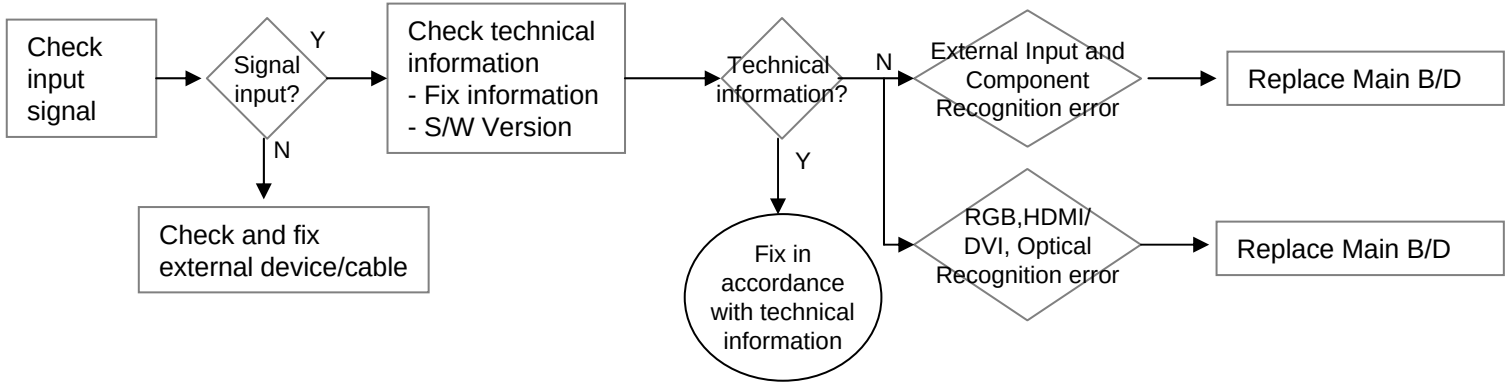


LCD TV	Error symptom	D. General Function Problem	Established date	2010. 2 .19	
		Remote control & Local switch checking	Revised date		10/13

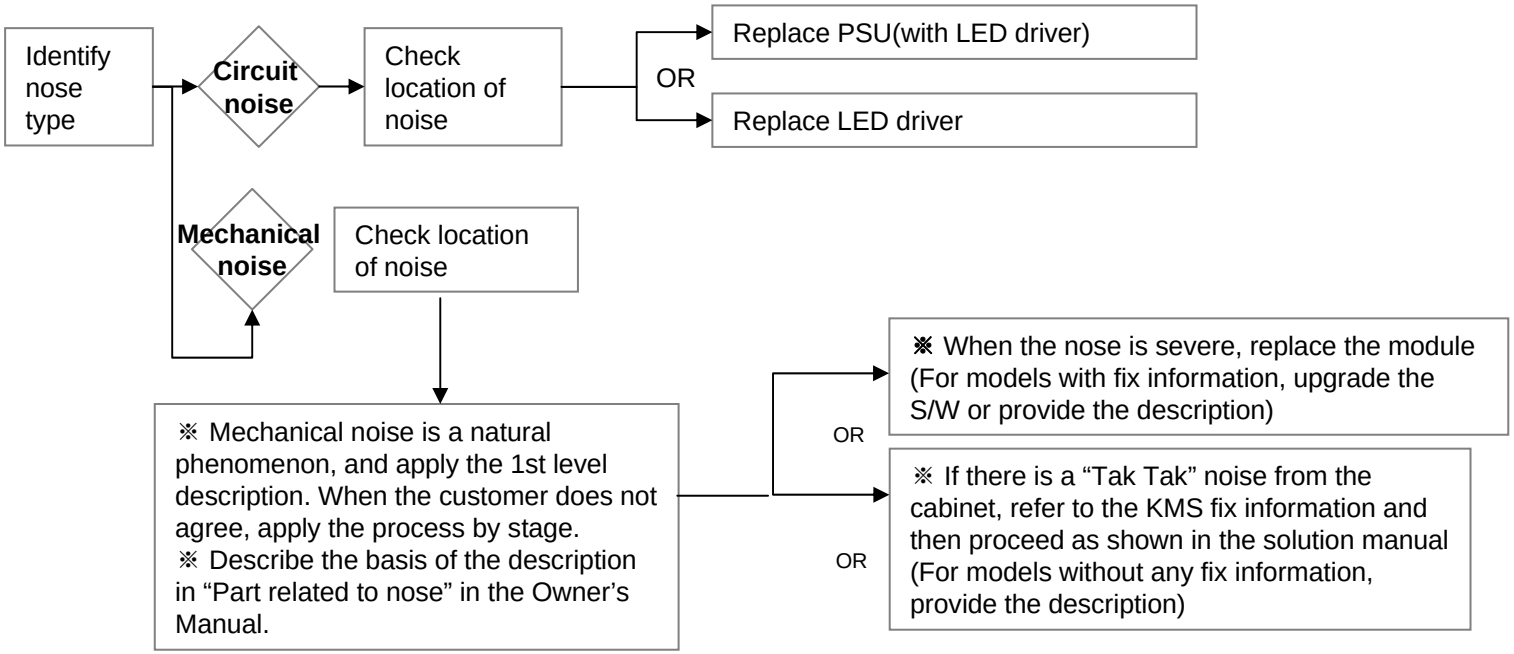
1. Remote control(R/C) operating error



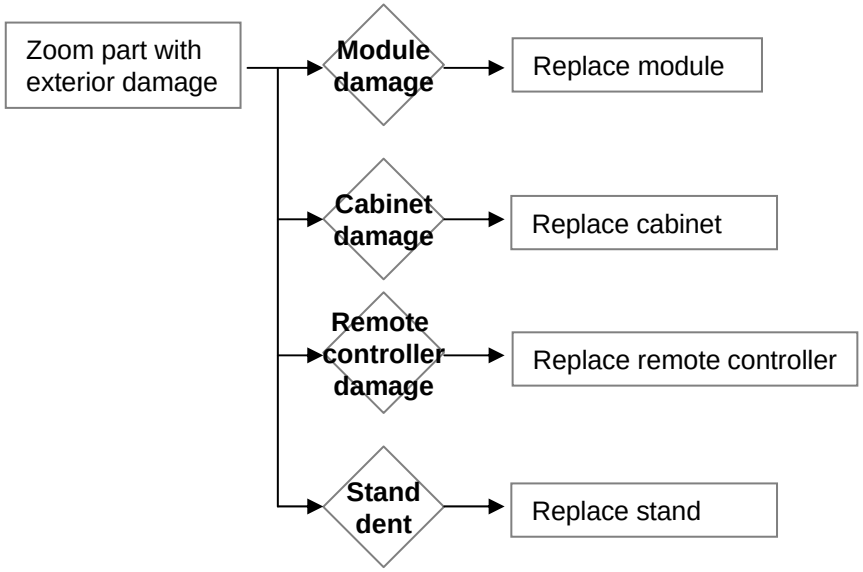
LCD TV	Error symptom	D. Function error	Established date	2010. 2 .19	
		External device recognition error	Revised date		11/13



LCD TV	Error symptom	E. Noise	Established date	2010. 2 .19	
		Circuit noise, mechanical noise	Revised date		12/13



LCD TV	Error symptom	F. Exterior defect	Established date	2010. 2 .19	
		Exterior defect	Revised date		13/13



Contents of LCD TV Standard Repair Process Detail Technical Manual

Continue to the next page

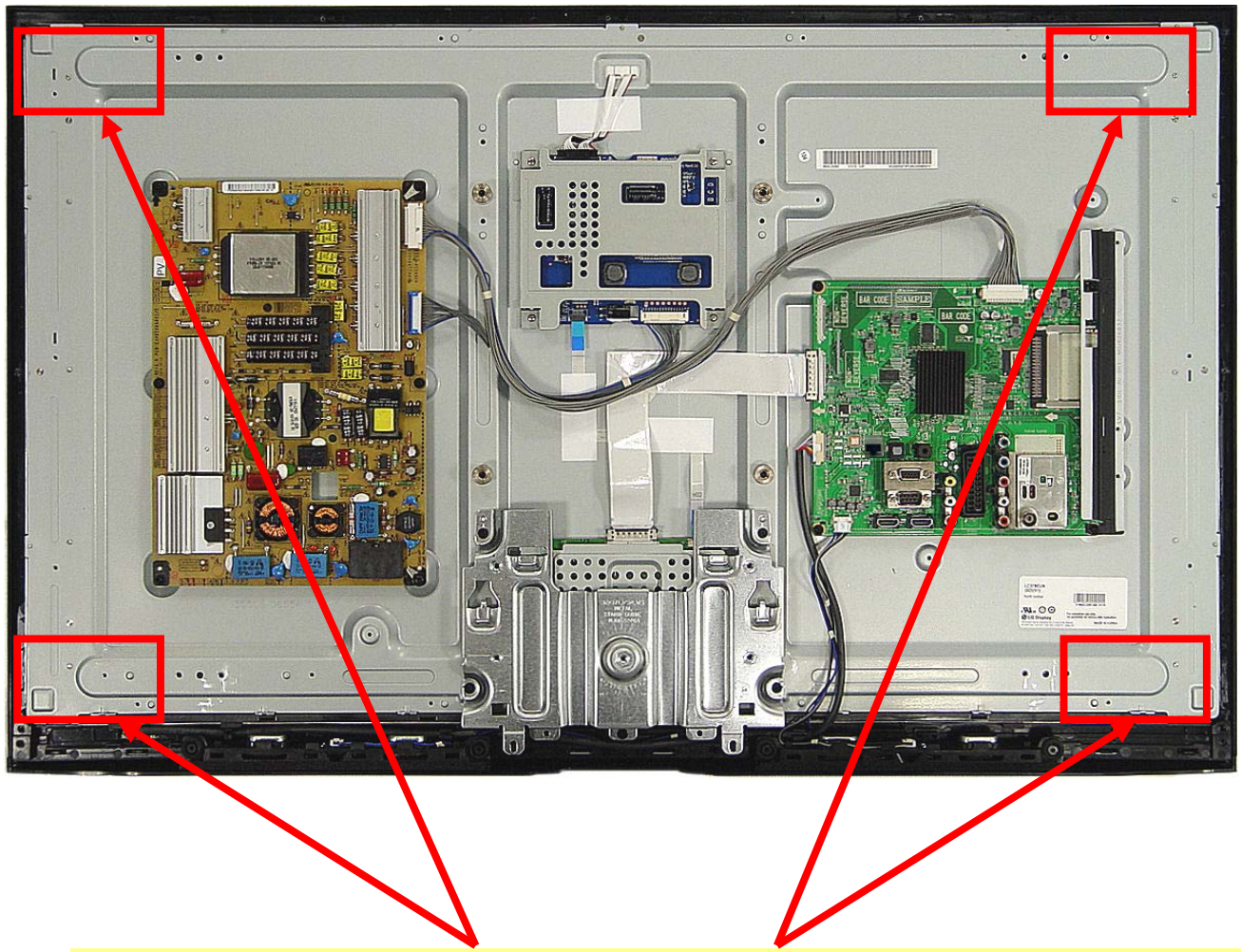
Contents of LCD TV Standard Repair Process Detail Technical Manual

Continued from previous page

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2011. 2 .07	
	Content	Check LCD back light with naked eye	Revised date		A1

<ALL MODELS>

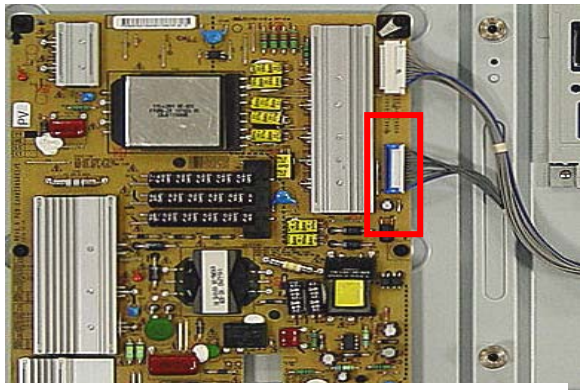


After turning on the power and disassembling the case, check with the naked eye, whether you can see light from 4 locations.

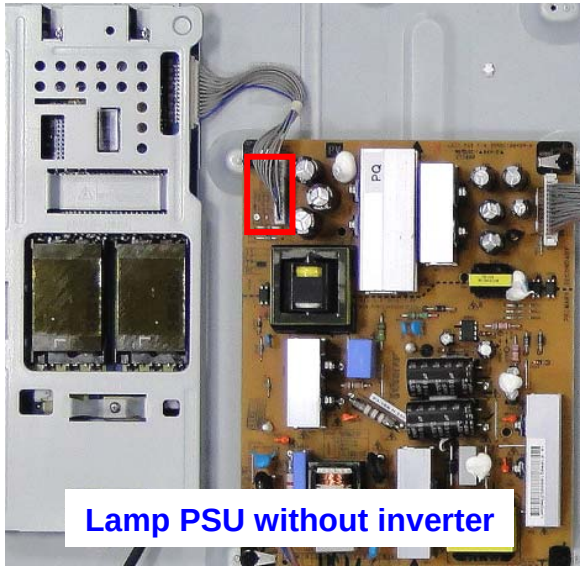
A1

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2011. 2 .07	
	Content	LED driver/lamp inverter B+ 24V measuring method	Revised date		A2



Edge LED PSU without LED Driver



Lamp PSU without inverter

Check the DC 24V, 12V, 3.5V and Inverter on

* ALEF/OS 42/47/55”/60”

Power Board ↔ Drive Board – PSU		
	14 pin	14 pin
1 ~ 5	24V	24V
6 ~ 10	GND	GND
11	Detect	Detect
12	Inverter On/Off	Inverter On/Off
13	Int. PWM	Int. PWM
14	Ext. PWM (PDIM)	Ext. PWM (PDIM)

* ALL 32”/37”

14 Pin (Power Board ↔ Driver) PSU	
1 ~ 5	24V
6 ~ 10	GND
11	Detect
12	Inverter On/Off
13	Int. PWM
14	Ext. PWM (PDIM)

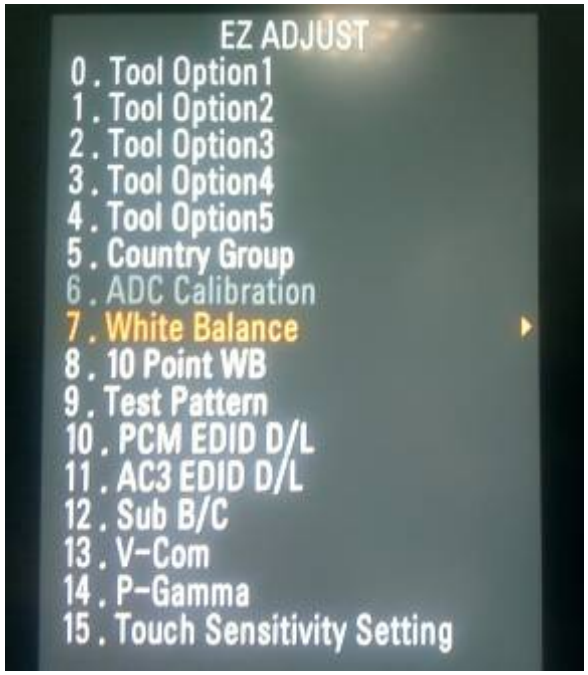
*** 26” ~ 47” : `11 Pin map**

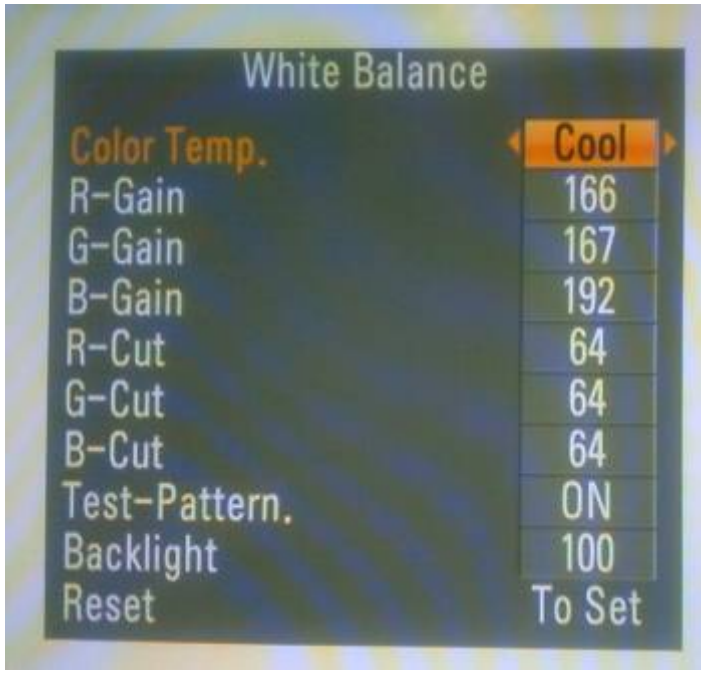
Lamp (Power Board ↔ Inverter) - PSU	
	14 Pin
1 ~ 5	24V
6 ~ 10	GND
11	Detect
12	Inverter On/Off
13	Int. PWM
14	Ext. PWM (PDIM)

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/Normal audio	Established date	2011. 2 .07	
	Content	Check White Balance value	Revised date		A3

<ALL MODELS>





Entry method

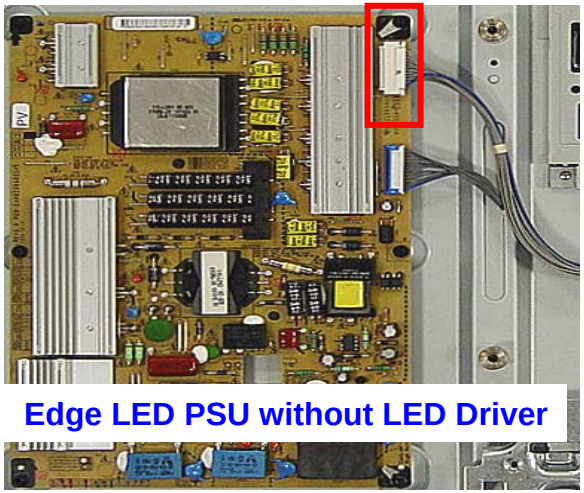
1. Press the ADJ button on the remote controller for adjustment.

2. Enter into White Balance of item 7.

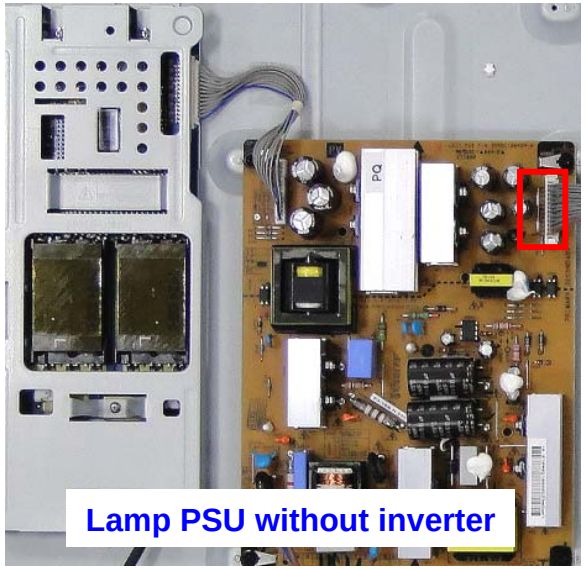
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_No video/ Audio	Established date	2011. 2 .07	
	Content	Power Board voltage measuring method	Revised date		A4



Edge LED PSU without LED Driver



Lamp PSU without inverter

Check the DC 20Vor24V, 12V, 3.5V.

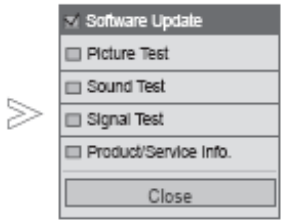
24 Pin (Power Board ↔ Main Board) - 공통			
SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	N.C
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim LED : N.C
21	12V	22	PWM Dim #1
23	N.C • Lamp SCANNING Model : PWM Dim #2	24	Error-out

24 Pin (Power Board ↔ Main Board)			
FW20020-24SB (FOOSUNG)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	GND
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim
21	12V	22	PWM Dim #1
23	N.C	24	Error-out

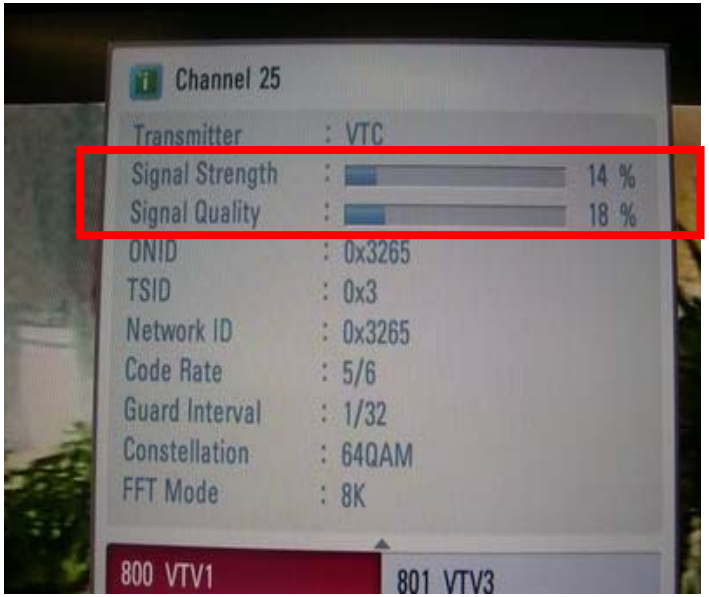
Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2011. 2 .07	
	Content	TUNER input signal strength checking method	Revised date		A6

<ALL MODELS>



MENU -→ red key(customer support -→ signal test -→ select channel



When the signal is strong, use the attenuator (-10dB, -15dB, -20dB etc.)

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2011. 2 .07	
	Content	LCD-TV Version checking method	Revised date		A7

<ALL MODELS>

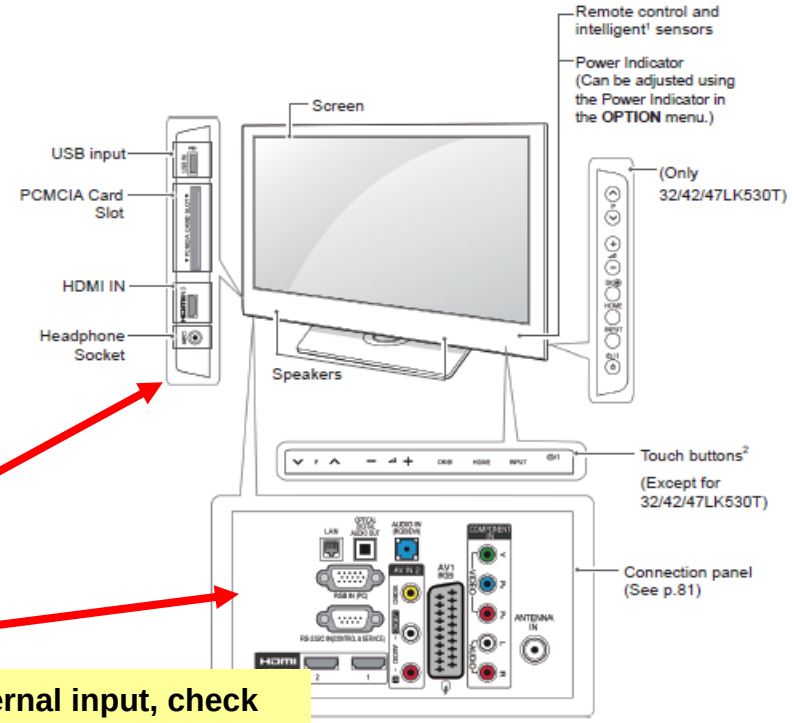
1. Checking method for remote controller for adjustment

Version

Press the IN-START with the remote controller for adjustment

• Image shown may differ from your TV.

Only 32/42/47LK530T, 32/42LK550T, 32/37/42/47LV355T



As the part connecting to the external input, check the screen condition by signal

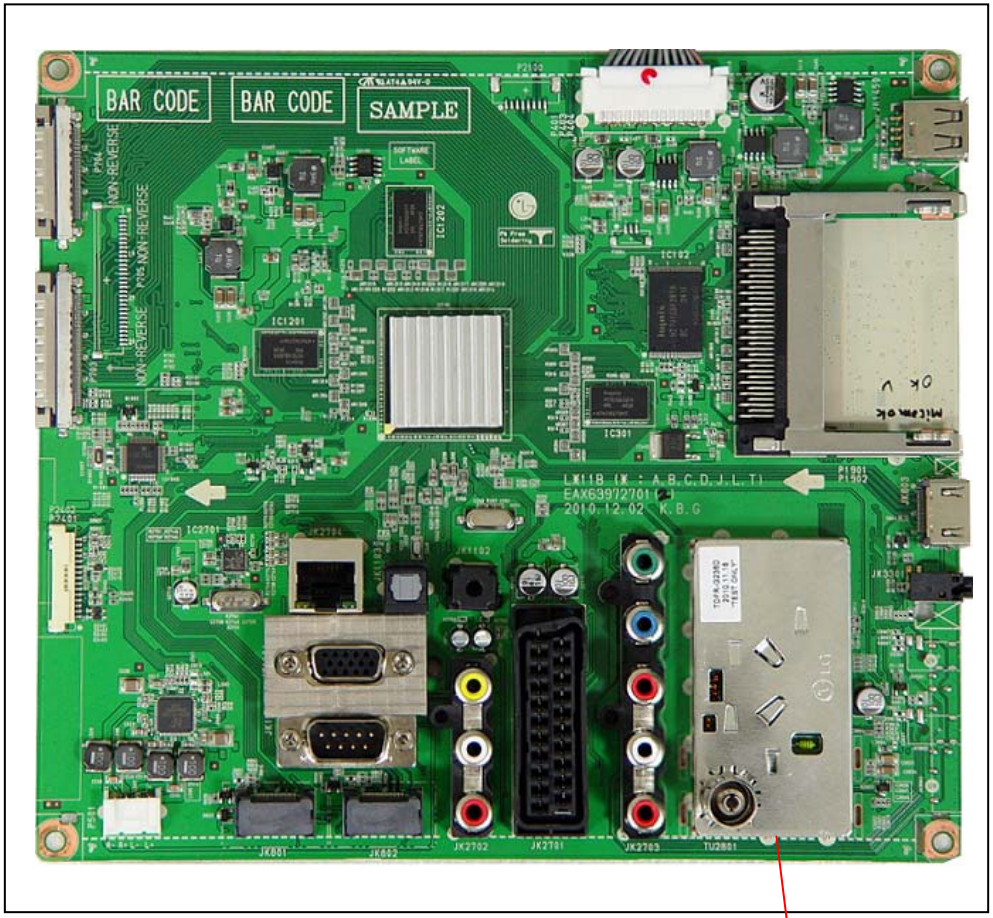
	Description
∨ P ∧	Scrolls through the saved programmes
− ◁ +	Adjusts the volume level
OK⊛	Selects the highlighted menu option or confirms an input
HOME	Accesses the main menus, or saves your input and exits the menus
INPUT	Changes the input source
⏻/I	Turns the power on or off

1 Intelligent sensor - Adjusts the image quality corresponding to the surrounding environment.
2. Touch Button - You can use the desired button function by touching.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Video error, video lag/stop	Established date	2011. 2 .07	
	Content	TUNER checking part	Revised date		A9

<ALL MODELS>

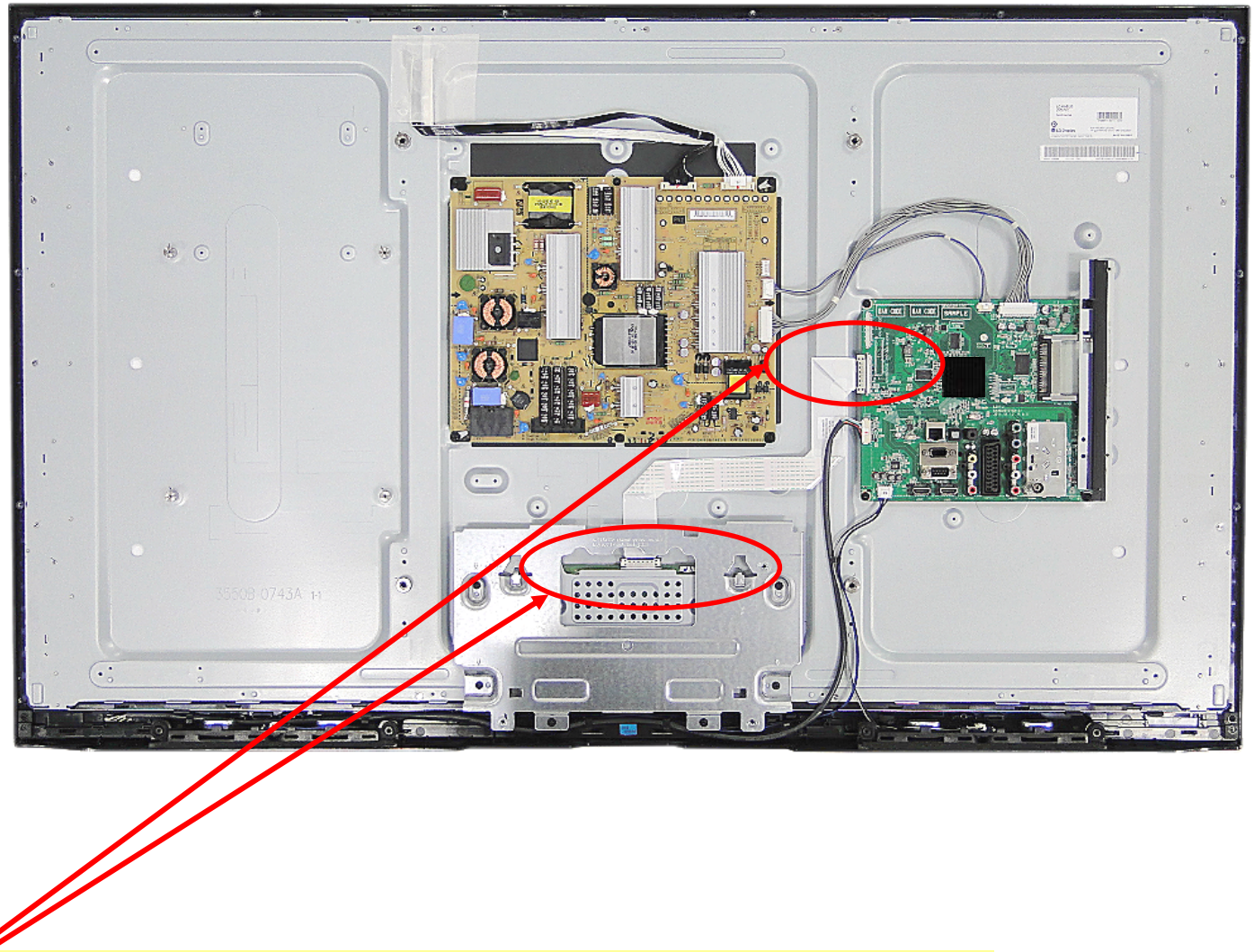


Checking method:
1. Check the signal strength or check whether the screen is normal when the external device is connected.
2. After measuring each voltage from power supply, finally replace the MAIN BOARD.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2011. 2 .07	
	Content	Check Link Cable (LVDS) reconnection condition	Revised date		A10

<LV** : Edge LED Series Models>

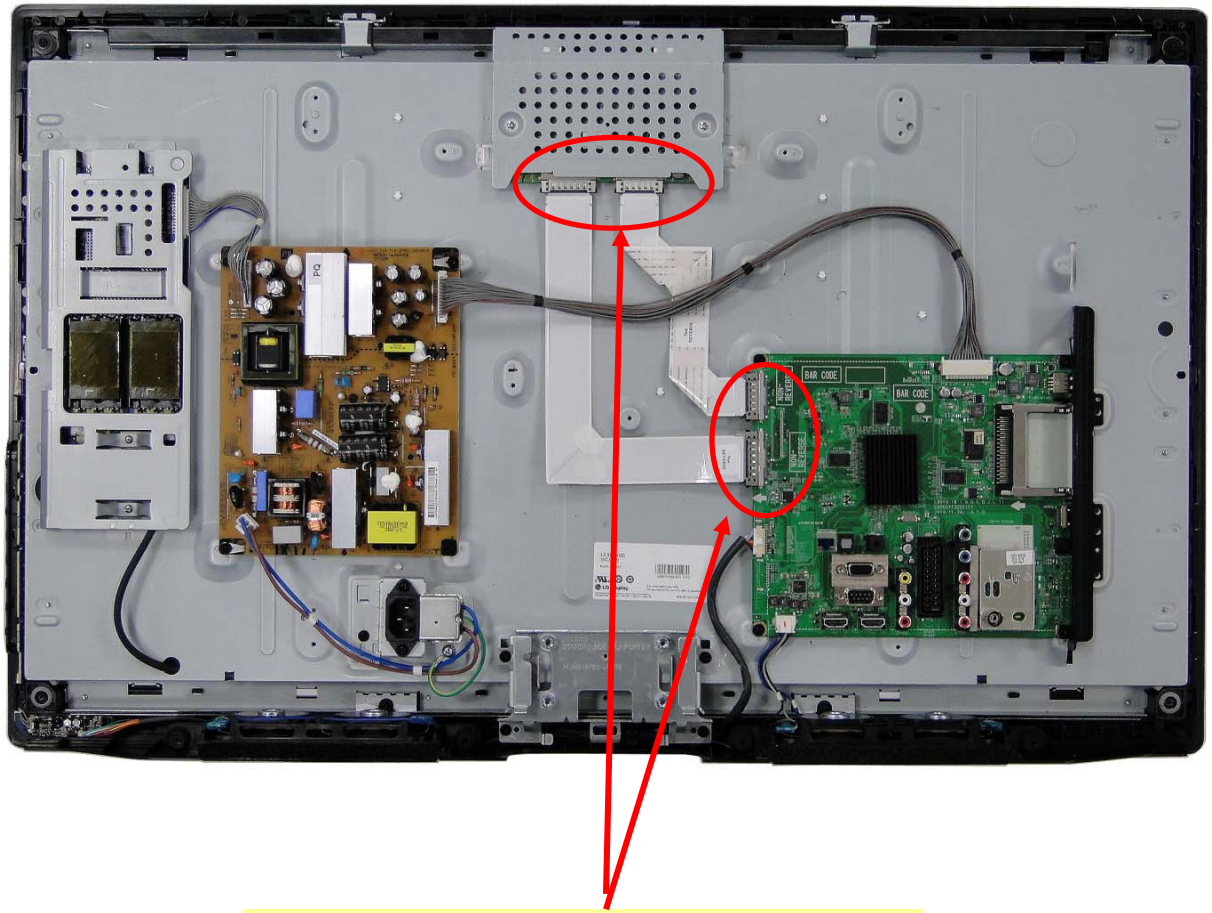


Check the contact condition of the Link Cable, especially dust or mis insertion.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2011. 2 .07	
	Content	Check Link Cable (LVDS) reconnection condition	Revised date		A11

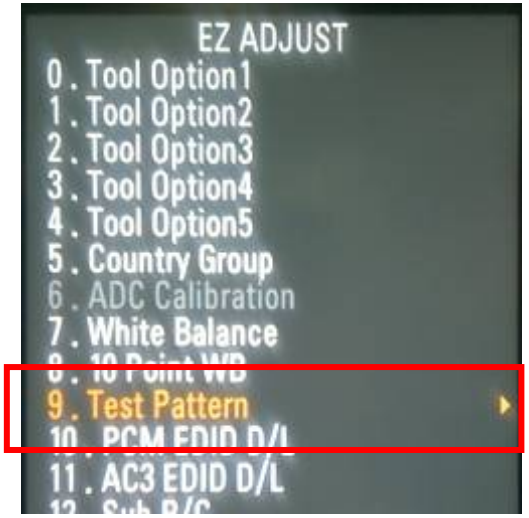
<LK** : Lamp series Models>

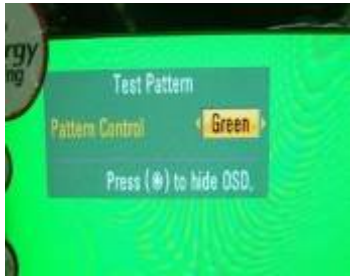


Check the contact condition of the Link Cable

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	A. Video error_Color error	Established date	2011. 2 .07	
	Content	Adjustment Test pattern - ADJ Key	Revised date		A12



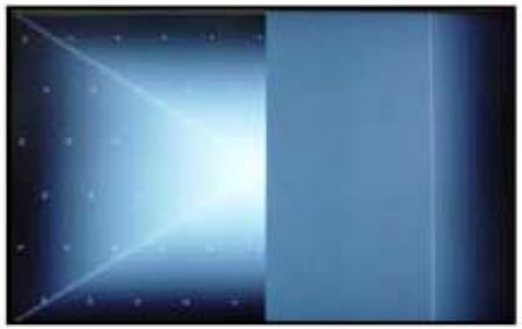


You can view 6 types of patterns using the ADJ Key

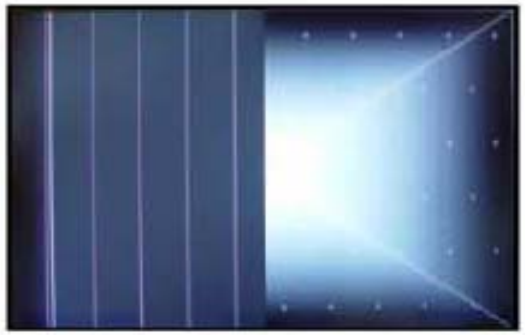
Checking item : 1. Defective pixel 2. Residual image 3. MODULE error (ADD-BAR,SCAN BAR..)
4.Video error (Classification of MODULE or Main-B/D!)

Appendix : Exchange T-Con Board (1)

Solder defect, CNT Broken

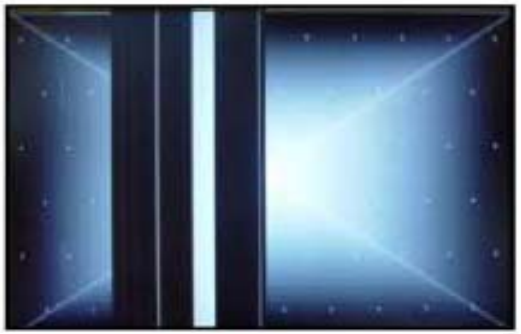


Solder defect, CNT Broken

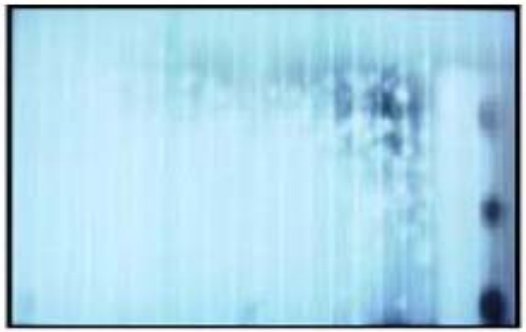


Solder defect, CNT Broken

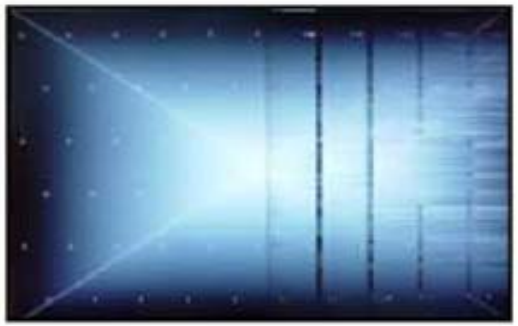
Solder defect, CNT Broken



Solder defect, CNT Broken



Abnormal Power Section

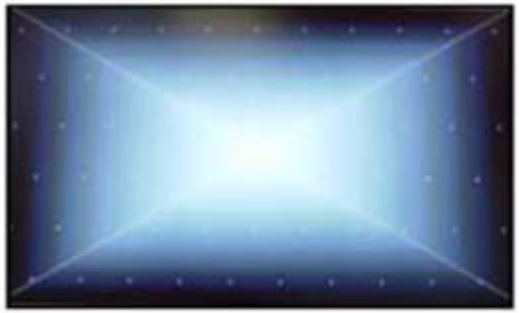


Solder defect, Short/Crack

Abnormal Power Section

Solder defect, Short/Crack

Appendix : Exchange T-Con Board (2)



Abnormal Power Section

Abnormal Power Section

Solder defect, Short/Crack

Solder defect, Short/Crack

Fuse Open, Abnormal power section

Abnormal Display

GRADATION

Noise

GRADATION

Appendix : Exchange PSU(LED driver)

No Light

Dim Light

Dim Light

Dim Light

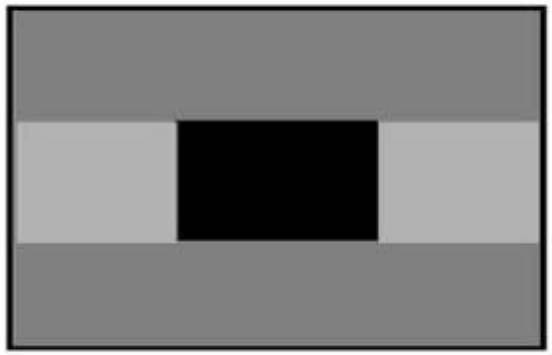
No picture/Sound Ok

Appendix : Exchange the Module (1)

Panel Mura, Light leakage

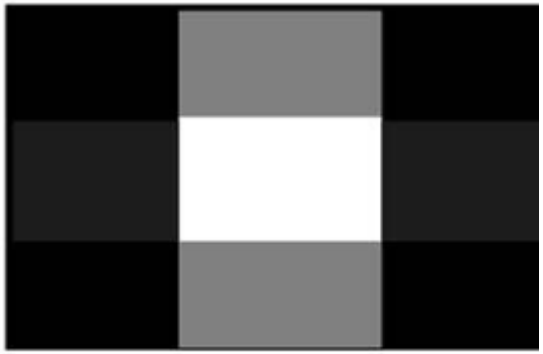
Panel Mura, Light leakage

Press damage



Crosstalk

Press damage



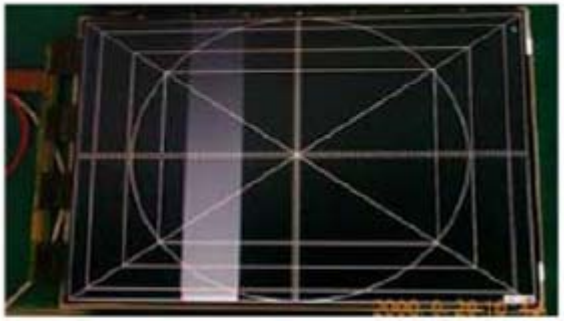
Crosstalk

Press damage

Un-repairable Cases

In this case please exchange the module.

Appendix : Exchange the Module (2)



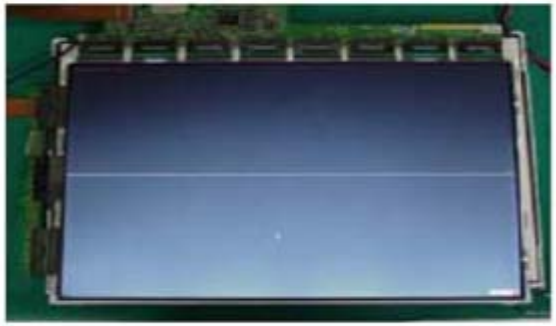
Vertical Block
Source TAB IC Defect

Vertical Line
Source TAB IC Defect

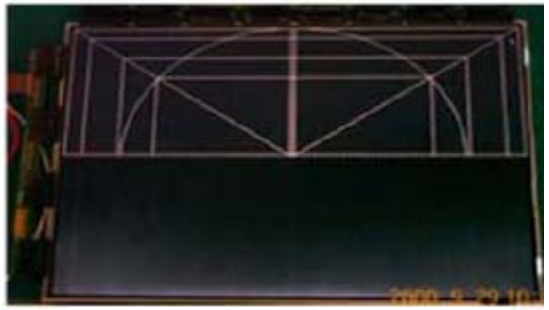
Vertical Block
Source TAB IC Defect

Horizontal Block
Gate TAB IC Defect

Horizontal Block
Gate TAB IC Defect



Horizontal line
Gate TAB IC Defect



Horizontal Block
Gate TAB IC Defect

Un-repairable Cases

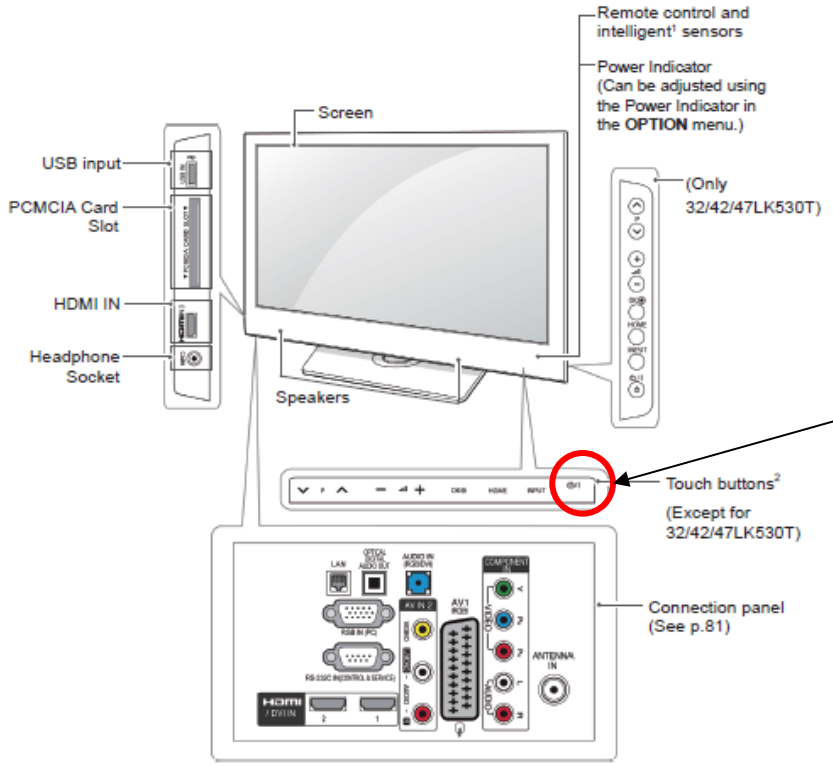
In this case please exchange the module.

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2010. 2 .19	
	Content	Check front display LED	Revised date		A17

• Image shown may differ from your TV.

Only 32/42/47LK530T, 32/42LK550T, 32/37/42/47LV355T



Front LED control :
Menu → Option → Power Indicator → Standby light ON

ST-BY condition: Red
Power ON condition: white

Button	Description
∨ P ∧	Scrolls through the saved programmes
− ◿ +	Adjusts the volume level
OK⊛	Selects the highlighted menu option or confirms an input
HOME	Accesses the main menus, or saves your input and exits the menus
INPUT	Changes the input source
⏻/I	Turns the power on or off

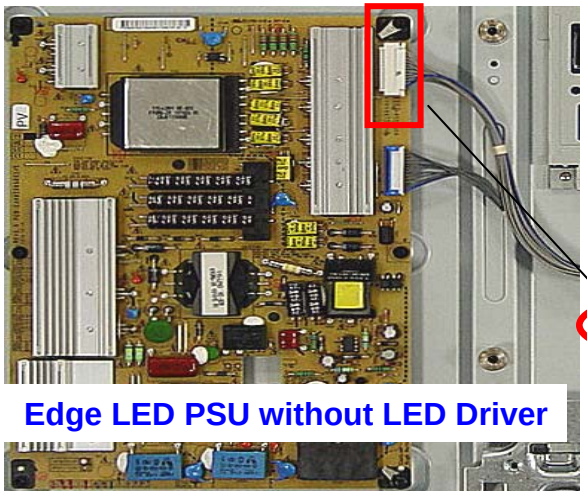
1 Intelligent sensor - Adjusts the image quality corresponding to the surrounding environment.
2. Touch Button - You can use the desired button function by touching.

A17

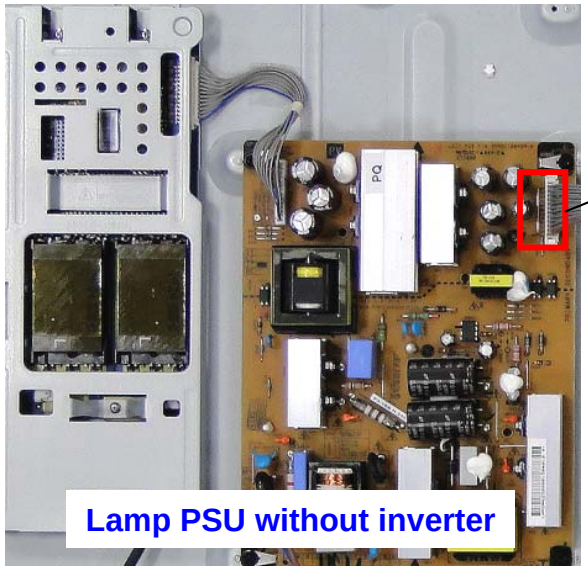
Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2011. 2 .07	
	Content	Check power input voltage and ST-BY 3.5V	Revised date		A18

For ’11 models, there is no voltage out for st-by purpose.
When st-by, only 3.5V is normally on.



Edge LED PSU without LED Driver



Lamp PSU without inverter

Check the 3.5V when st-by

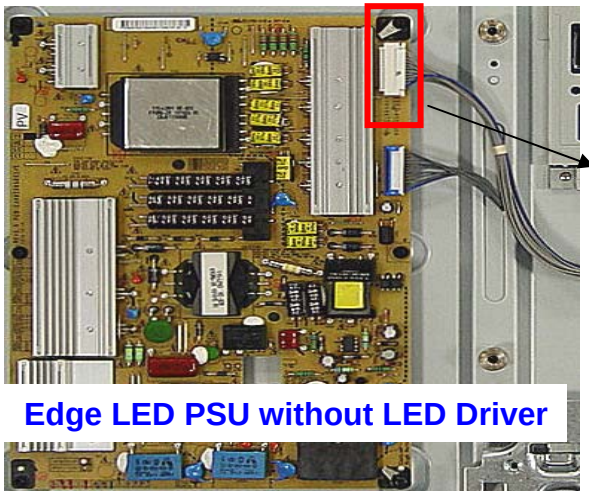
24 Pin (Power Board ↔ Main Board) - 공통 SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	N.C
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim LED : N.C
21	12V	22	PWM Dim #1
23	N.C • Lamp SCANNING Model : PWM Dim #2	24	Error-out

24 Pin (Power Board ↔ Main Board) FW20020-24SB (FOOSUNG)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	GND
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim
21	12V	22	PWM Dim #1
23	N.C	24	Error-out

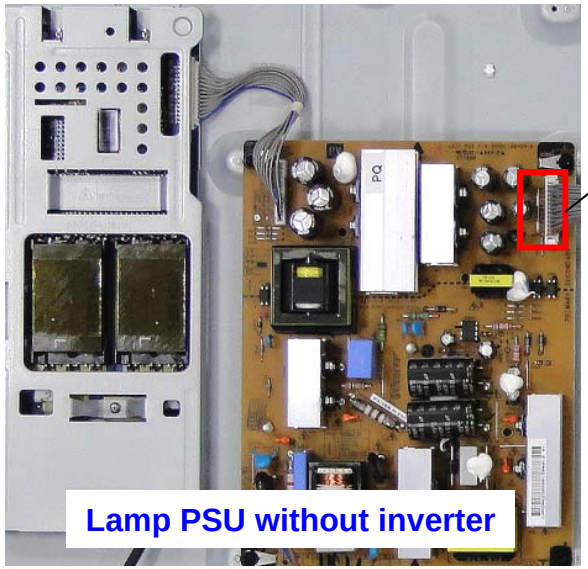
Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _No power	Established date	2011. 2 .07	
	Content	Checking method when power is ON	Revised date		A19

Check “power on” pin is high



Edge LED PSU without LED Driver



Lamp PSU without inverter

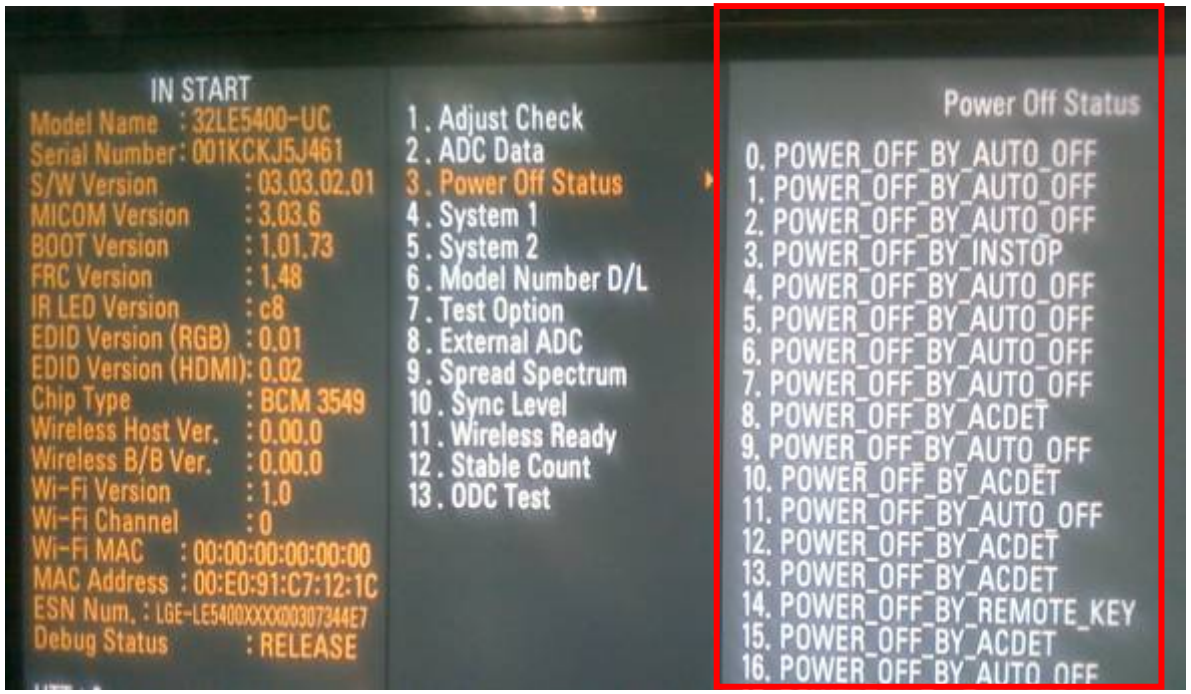
24 Pin (Power Board ↔ Main Board) - 공통 SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	N.C
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim LED : N.C
21	12V	22	PWM Dim #1
23	N.C • Lamp SCANNING Model : PWM Dim #2	24	Error-out

24 Pin (Power Board ↔ Main Board) FW20020-24SB (FOOSUNG)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	GND
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim
21	12V	22	PWM Dim #1
23	N.C	24	Error-out

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	B. Power error _Off when on, off whiling viewing	Established date	2011. 2 .07	
	Content	POWER OFF MODE checking method	Revised date		A22

<ALL MODELS>



Entry method

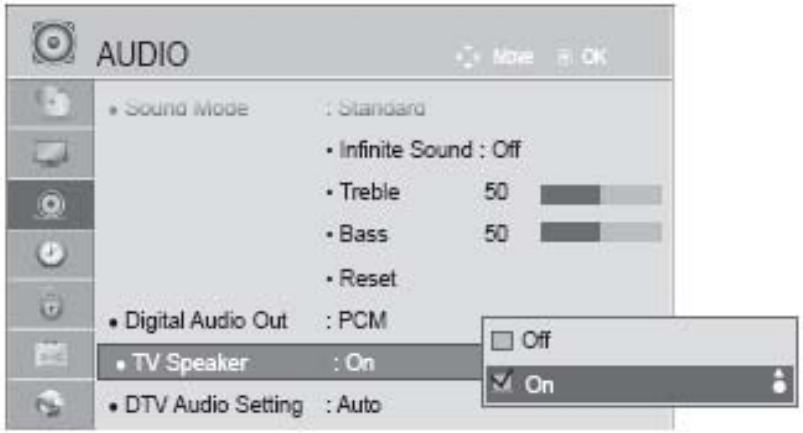
1. Press the IN-START button of the remote controller for adjustment

2. Check the entry into adjustment item 3

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2011. 2 .07	
	Content	Checking method in menu when there is no audio	Revised date		A24

<ALL MODELS>



Checking method

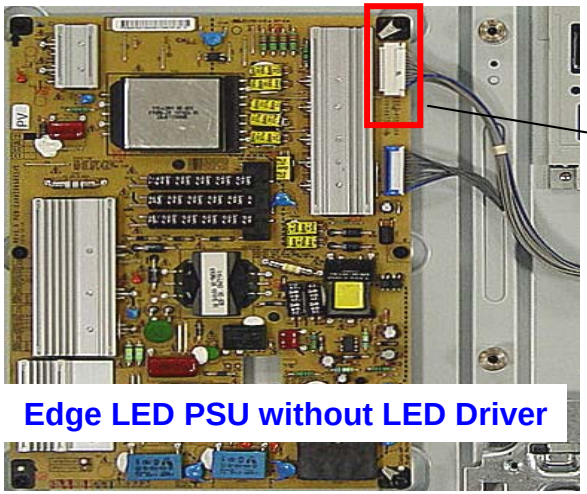
1. Press the MENU button on the remote controller
2. Select the AUDIO function of the Menu
3. Select TV Speaker from Off to On

Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	C. Audio error_No audio/Normal video	Established date	2011. 2 .07	
	Content	Voltage and speaker checking method when there is no audio	Revised date		A25

<ALL MODELS>

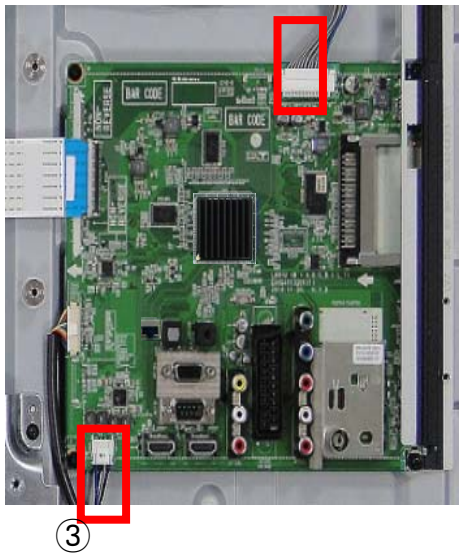
②



Edge LED PSU without LED Driver

24 Pin (Power Board ↔ Main Board) - 공통			
SMAW200-H24S (YEONHO)			
1	Power on	2	20V (24V)
3	20V (24V)	4	20V (24V)
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	N.C
17	12V	18	Inverter On/off
19	12V	20	Lamp : A-Dim LED : N.C
21	12V	22	PWM Dim #1
23	N.C • Lamp SCANNING Model : PWM Dim #2	24	Error-out

①



③

Checking order when there is no audio

① Check the contact condition of 20V or 24V connector of Main Board

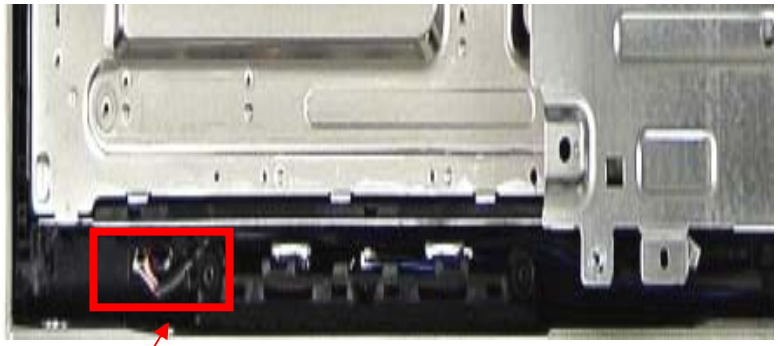
② Measure the 24V input voltage supplied from Power Board
(If there is no input voltage, remove and check the connector)

③ Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and output terminal, the speaker is normal.

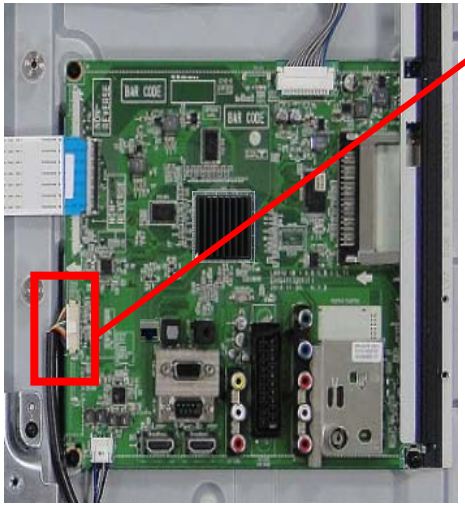
Standard Repair Process Detail Technical Manual

LCD TV	Error symptom	D. Function error_ No response in remote controller, key error	Established date	2011. 2 .07	
	Content	Remote controller operation checking method	Revised date		A27

<ALL MODELS>



1



2

3

4

P2401, P2402	
1	EYEQ_SCL
2	EYEQ_SDA
3	GND
4	KEY1
5	KEY2
6	St 3.3V
7	GND
8	LED_B
9	IR
10	GND
11	Normal 3.3V
12	LED_R
13	GND
14	Soft Touch_SCL
15	Soft Touch_SDA

Checking order

1, 2. Check IR cable condition between IR & Main board.
3. Check the st-by 3.3V on the terminal 6.
4. When checking the Pre-Amp when the power is in ON condition, it is normal when the Analog Tester needle moves slowly, and defective when it does not move at all.